

Table S1: Categorisation Framework
of culturally significant relationships between people and freshwater fauna

1. Consumptive Use
1.1. Food and culinary heritage
1.1.1. Food security
1.1.2. Nutritional security
1.1.3. Delicacies
1.1.4. Consumption in ritual or social practices
1.1.5. Non-target consumption
1.1.6. Food processing and preservation
1.2. Knowledge related to capture
1.2.1. Tracking and locating knowledge
1.2.2. Capturing knowledge
1.2.3. Killing knowledge
1.3. Healing and pharmacology
1.3.1. Traditional medicine and other healing systems
1.3.2. Conventional medicine
1.3.3. Other pharmacological uses
1.4. Craftsmanship
1.4.1. Material in crafts, artefacts or tools
1.4.2. Material in costume, clothing, or jewellery
1.5. Energy
1.5.1. Energy from primary use
1.5.2. Energy from secondary use
1.6. Companionship and decoration
1.7. Labour
1.8. Non-use removal
2. Cultural Landscapes, Sites and Stewardship
2.1. Sites and Structures
2.1.1. Ancient and prehistoric (pre-500 common era, CE)
2.1.2. Post-classical (500CE-1599CE)
2.1.3. Traditional and modern (post-1599CE)
2.2. Stewardship Practices
2.2.1. Stewardship of target species
2.2.2. Stewardship of an assemblage of species
2.2.3. Stewardship of water and land
3. Knowledge Systems
3.1. Names
3.1.1. Folk taxonomies
3.1.2. Vocabulary of nature
3.1.3. Alternative word usage
3.2. Observations
3.3. Knowledge acquisition
3.4. Knowledge transmission
3.5. Knowledge inspiration

4. Worldviews, Beliefs and Identities

- 4.1. Worldviews and belief systems
- 4.2. Spiritual or religious beliefs
- 4.3. Narrative accounts
- 4.4. Identity and relationships
 - 4.4.1. Kinship
 - 4.4.2. Supporting cultural identities
 - 4.4.3. Sense of or connection to place
- 4.5. Symbolic or associative meaning
 - 4.5.1. Symbolic meaning
 - 4.5.2. Figurative language
 - 4.5.3. Associative naming

5. Cultural and Social Practices

- 5.1. Social practices, rituals and festive events
- 5.2. Social organisation
- 5.3. Rules or customary norms

6. Recreation, Leisure and Tourism

- 6.1. Recreational hunting and fishing
- 6.2. Traditional sports and games
 - 6.2.1. Live animal used in sports and games
 - 6.2.2. Representation in sports and games
- 6.3. Aesthetics
- 6.4. Tourism
 - 6.4.1. Cultural tourism
 - 6.4.2. Nature-based tourism
- 6.5. Other recreation or leisure

7. Creative Expression

- 7.1. Visual arts
 - 7.1.1. Representation in artworks
 - 7.1.2. Representation in architecture
 - 7.1.3. Representation in crafts, artefacts and tools
 - 7.1.4. Representation in costume, clothing and jewellery
 - 7.1.5. Representation in culinary preparations
 - 7.1.6. Other visual arts
- 7.2. Performing arts
 - 7.2.1. Music
 - 7.2.2. Dance
 - 7.2.3. Theatre
 - 7.2.4. Cinema
 - 7.2.5. Other performing arts
- 7.3. Language arts
 - 7.3.1. Literature
 - 7.3.2. Poetry
 - 7.3.3. Other language arts
- 7.4. Other forms of creative inspiration

Table S2: Definitions of categories and subcategories

<i>Category</i>	<i>Subcategory</i>	<i>Definition</i>
1. Consumptive Use		
1.1.	Food and culinary heritage	
1.1.1.	Food security	The consumption of the species contributes to food security, where food security ‘exists when all people at all times have physical and economic access to sufficient safe and nutritious food to meet their dietary needs and food preferences for a healthy and active life’ (FAO, 1996)
1.1.2.	Nutritional security	The consumption of the species contributes to the nutritional component of food security, for example as an essential source of macronutrients and/or micronutrients. For example, a macronutrient often provided by consumption of freshwater fauna is protein, and micronutrients are omega-3 fatty acids and vitamin B12 (FAO & Duke University & WorldFish, 2023).
1.1.3.	Delicacies	The species is important as part of the culinary tradition (culinary heritage) of a given culture, with culinary traditions comprising both aspects of food and cooking (Partarakis et al., 2021). Delicacies are highly desirable in a given culture, but are not necessarily essential to food and nutritional security.
1.1.4.	Consumption in ritual or social practices	Ritual and social practices are ‘habitual activities that structure the lives of communities and groups and that are shared by and relevant to many of their members’ (UNESCO, 2003). This category encompasses the consumption of a species or its products that is part of such practices.
1.1.5	Incidental/additional capture	The consumption of species which are not the primary target of fishing or hunting activities but will be utilised if caught unintentionally, i.e. as bycatch, defined as the incidental capture of non-target species (FAO & Duke University & WorldFish, 2023).

1.1.6	Food processing and preservation	The species is important for particular methods of food processing and preservation in a given culture.
1.2.	Knowledge related to capture	
1.2.1.	Tracking and locating knowledge	The knowledge, including skills, techniques and tools, in a given culture for tracking, locating or attracting the species, for any reason, including the knowledge related to the construction of tools and the material objects that result from this knowledge.
1.2.2.	Capturing knowledge	The knowledge, including skills, techniques and tools, in a given culture for capturing the species, for any reason, including the knowledge related to the construction of tools and the material objects that result from this knowledge. For example, the skills required to make a type of fishing gear, as well as the fishing gear itself.
1.2.3.	Killing knowledge	The knowledge, including skills, techniques and tools, in a given culture for killing the species, for any reason, including the knowledge related to the construction of tools and the material objects that result from this knowledge. For example, the skills required to make a particular type of weapon to kill an animal, as well as the weapon itself.
1.3.	Healing and pharmacology	
1.3.1.	Traditional medicine and other healing systems	The use of a species or its products in traditional medicine, defined as ‘the sum total of the knowledge, skill and practices based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness’ (WHO, 2013).
1.3.2.	Conventional medicine	The use of a species or its products in the broad category of medical practice that is also known as Western medicine, biomedicine, modern medicine or allopathic medicine (Zhang, 2001).
1.3.3.	Other pharmacological uses	The use of a species or its derivatives as a chemical substance to induce an impact on a living organism, the use of which is not within a healing system. For example, the use of a species derivative for its psychoactive properties, as a poison, or for practices such as improving luck or spiritual cleansing.

1.4.	Craftsmanship	
1.4.1.	Material in crafts, artefacts or tools	<p>Material derived from the species is used by people in creating artefacts, where an artefact is ‘an object made or modified by human workmanship, as opposed to one formed by natural processes’ (Oxford English Dictionary, 2023a). This category specifically covers objects where the primary purpose is not to be worn by a human. This category encompasses both the skills required to create artefacts, as well as the tangible artefacts themselves. Such artefacts may include crafts, which are products to which the manual contribution of the artisan is the most substantial component (International Trade Centre, 1997), and tools, which are devices used to carry out a particular function.</p> <p>Material derived from freshwater fauna may include skins, scales, bones, isinglass, and shells. Crafts, artefacts and tools may include household ornamentation, ceremonial objects, musical instruments, toys, shelter construction, and weaponry.</p>
1.4.2.	Material in costume, clothing or jewellery	<p>Material derived from the species is used by people in creating costume, clothing or jewellery i.e. items where the primary purpose is to be worn by a human. This category encompasses both the skills required to make these items, the items themselves, and the wearing of these items within a given culture.</p> <p>Material derived from freshwater fauna may include skins, scales, bones, isinglass, and shells.</p>
1.5.	Energy	Production of biomass-based fuels (Díaz et al., 2018)
1.5.1.	Energy from primary use	<p>Production of fuel lethally using the animal itself.</p> <p>For example, oils derived from the body of animals, or their eggs.</p>
1.5.2.	Energy from secondary use	<p>Production of fuel using products of the animal (non-lethal).</p> <p>For example, animal waste used as a fuel.</p>
1.6.	Companionship and decoration	<p>Live organisms being directly used for company and/or decoration (Díaz et al., 2018).</p> <p>For example, ornamental fish in an aquaria, or pets.</p>
1.7.	Labour	<p>Live organisms being directly used for labour (Díaz et al., 2018).</p> <p>For example, the species is used in fishing, herding, searching, or guarding.</p>

1.8.	Non-use removal	<p>The species is killed or removed from the system without an intention to use it. This could be due to the species being seen negatively or as a detriment.</p> <p>For example, species are removed due to being seen as dangerous, unlucky, inauspicious or a harbinger, or because they are believed to compete with or prey upon other species.</p>
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2. Cultural Landscapes, Sites and Stewardship

2.1	Sites and structures	<p>The species is relevant for the existence of cultural landscapes, ‘combined works of nature and humankind [that] express a long and intimate relationship between peoples and their natural environment’ (UNESCO World Heritage Centre, no date), including areas of human habitation and associated sites and structures.</p> <p>For freshwater fauna, this could include construction of pools, location of settlements, and introduction of species. The landscape or sites of structure may still be in use, or may be historical, however the earliest dating of sites determine the category they fall within. For example, a pond built in 1672 would fall within 2.2, even if still in use. Similarly, the location of a particular fishing settlement that settled in a given location in 1700 would fall in 2.3, even if the fishers who constructed the settlement had always occupied the broader surrounding territory. Note that the symbolic representation of species in architecture falls in 6.1.2 and material use of a species in construction falls in 1.3.1.</p>
2.1.1.	Ancient and Prehistoric (pre-500CE)	Landscapes, sites and structures from before 500 common era (CE). The end of the ancient period is generally chosen by historians as around 500 CE (Hughes, 2012)
2.1.2	Post-classical (500CE-1599CE)	Landscapes, sites and structures from 500 CE to 1599 CE, choosing the same date cut off as Ramsar Culture Working Group (Papayannis & Pritchard, 2008)
2.1.3	Traditional and modern (post-1599CE)	Landscapes, sites and structures since 1599 CE, choosing the same date cut off as Ramsar Culture Working Group (Papayannis & Pritchard, 2008)
2.2.	Stewardship practices	<p>Stewardships either targeted to or influencing the species. Stewardship practices are “actions taken by individuals, groups or networks of actors, with various motivations and levels of capacity, to protect, care for or responsibly use the environment in pursuit of environmental</p>

		and social outcomes in diverse social-ecological contexts” (Bennett et al. 2018). In the context of culturally informed relationships, stewardship is often realised through cultural practices and customs (Loring 2022), and are “manifestations of people’s relationships with other elements of Nature, aligned with cultural identity” (Mattalia et al., 2025, in review). We follow the designation of three groups of stewardship practices after Mattalia (2025, in review).
2.2.1.	Stewardship of target species	Stewardship directly involving the target species, such as sparing individuals or a population, modifying individuals, supplementary feeding, translocation, or propagation in-situ (Mattalia et al. 2025, in review)
2.2.2.	Stewardship of an assemblage of species	Stewardship involving a community of species, where the species can be the target of stewardship, or influenced in stewardship of another species. For example, maintaining or adding companion species, removing or disfavouring competing and predating species, and place avoidance (Mattalia et al. 2025, in review)
2.2.3.	Stewardship of water and land	Stewardship involving water or land being altered to steward the species, such as by maintaining clean water, building pools, or restructuring of underwater substrates (Mattalia et al. 2025, in review)

3. Knowledge Systems

3.1.	Names	
3.1.1.	Folk taxonomies	The species has a folk name, and is featured in folk taxonomies. Folk names and taxonomies are a culturally-rooted system of classification, conveying knowledge about the species and its cultural conception (Berlin et al., 1973; Phaka et al., 2019). This class includes all and any name of a species which is not its two-part scientific name
3.1.2.	Vocabulary of nature	Names, epithets or sobriquets used in the naming or common identification of the species, which convey traditional knowledge about the species, including ecological, behavioural or spiritual knowledge, or associations with another cultural concept.

3.1.3.	Alternative word usage	The use of a word to name a species in a particular culture and language has another meaning, either related or unrelated to the species itself.
3.2.	Observations	Observations of the species behaviour, life history or ecology are interpreted using culturally transmitted knowledge, such as traditional knowledge or indigenous knowledge, and are often rooted in such knowledge systems (Phaka, 2022).
3.3.	Knowledge acquisition	The species plays a role in knowledge acquisition, not just as an object of study, but as a vehicle or catalyst for broader understanding or exploration. For example, in research contexts as a model organism or a focal point for inquiry. Such acquisition or research may be in any knowledge system, including Western science and Indigenous science.
3.4.	Knowledge transmission	The species is relevant in the cultural transmission of knowledge (Cristancho & Vining, 2004). This may be either or both intra- and inter- generationally, and both formal and informal education. This may involve the passing on of knowledge about the species itself, or interactions with the species provide a context for transferring knowledge. This interaction may be directly with the physical species, or through representations or concepts of the species.
3.5.	Knowledge inspiration	The species has provided the inspiration for knowledge, such as particular ways of knowing or doing.

4. *Worldviews, Beliefs and Identities*

4.1.	Worldviews and belief systems	The species plays a key or specific role in a cultural worldview, which is the perceptual framework of a cultural group, in which worldviews are 'socially constructed realities which humans use to frame perception and experience' and refers to the 'psychological, cognitive and affective determinants of behaviour' (Johnson et al., 2011). It includes beliefs, such as on cosmology, cosmogonies, the afterlife, goals, values and ethics. Cultural worldviews may or may not be distinguishable from religious or spiritual beliefs, depending on the culture (McCutcheon, 1995). In this instance, the significance item would fall in both categories.
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4.2.	Spiritual or religious beliefs		Spiritual or religious beliefs are those beliefs that “endorse metaphysical claims such as the existence of immaterial or supernatural agents” such as deities or ancestral spirits (Johnson et al., 2011), and are typically related to the divine or sacred. Cultural worldviews may or may not be distinguishable from religious or spiritual beliefs, depending on the culture (McCutcheon, 1995). In this instance, the significance item would fall in both categories.
4.3.	Narrative accounts		Narrative accounts involving the species. Narratives have a storyline, which can be realised in various forms (Holzhausen & Grecksch, 2021). For example, they may be considered as histories, cosmogonies, fables, myths, legends, or folktales, depending on the culture. Stories may be non-fictional or fictional, or combine elements of truth and myth. Typically, these narrative accounts would be orally transmitted (part of folklore), although they may be written up formally too (i.e. not written works by a single individual, which are considered in 6.3.2)
4.4.	Identity and relationships		
4.4.1.		Kinship	The species, or individuals of the species, are viewed as kin to people within a given culture. Such a relationship may be familial, totemic, or any other conceptualisation of kin.
4.4.2.		Supporting cultural identities	The species supports the cultural identity of a group, where cultural identity ‘refers to identification with, or sense of belonging to, a particular group based on various cultural categories’ (Chen, 2014).
4.4.3.		Sense of or connection to place	The species is of importance to the sense of, connection to, or memory of a particular place or landscape to a given cultural group. For example, species that have become emblematic of a particular region (Schirpke et al., 2018), species after which places are named, or species whose presence in a particular landscape is seen as important in a given culture.
4.5.	Symbolic or associative meaning		
4.5.1.		Symbolic meaning	A species holds a particular symbolic meaning in a given culture, typically being representative of a particular attribute such as endurance, strength or intelligence.
4.5.2.		Figurative language	The species is referenced in idioms, proverbs or other turns of phrase used in a particular language and culture

4.5.3.	Associative meaning	The name or characteristics of the species are used to convey a particular cultural meaning when used as a descriptor.
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5. Cultural and Social Practices

5.1.	Social practices, rituals and festive events	Ritual and social practices are ‘habitual activities that structure the lives of communities and groups and that are shared by and relevant to many of their members’ (UNESCO, 2003). This category encompasses the involvement of a species, either materially or immaterially, in such practices. For species consumed in practices, there is complete overlap with category 1.1.3.
5.2.	Social organisation	The species plays a role in the social organisation (structure) of a given culture, that is, the functional differentiation of social groups within this culture (Hofstee, 1960). For example, gender roles, (in)equity, social stratification.
5.3.	Rules or customary norms	The species or its use is important for, or regulated by, rules or customary norms. For example, the use of a species is regulated by laws, and/or taboos, or a species seen to play a role in the upholding of social and cultural rules or norms, such as enacting punishments.

6. Recreation, Leisure and Tourism

6.1.	Recreational hunting and fishing	Recreational fishing or hunting is fishing or hunting for animals that do not constitute the individual’s primary resource to meet essential physiological needs. i.e. the purpose of fishing or hunting is not primarily subsistence or commercial. This definition simply expands the definition of recreational fishing by Arlinghaus & Cooke (2009) to also encompass recreational hunting. As such, the definition embraces diverse attitudes, value systems and cultural perceptions (Arlinghaus & Cooke, 2009).
6.2.	Traditional sports and games	‘Traditional sport and games are motor activities of leisure and recreation which can have a ritual character... They are practiced in an individual or collective manner, deriving from regional or local identity; they are based on rules accepted by a group that organises competitive or non-competitive activities’ (UNESCO, 2017, p.1)

6.2.1.	Live animal used in sports and games	Living individuals of the species are used as part of sports or games. For example, blood sports and racing.
6.2.2.	Representation in sports and games	The species is a figurative or representative actor or character in sports or games. For example, a character played in playground games, or game items shaped like the species
6.3.	Aesthetics	The species provides opportunities for physically and psychologically beneficial activities (Díaz et al., 2018), healing, relaxation, recreation, leisure or aesthetic enjoyment based on close contact, but where the animal is neither captured nor killed. For example, wildlife watching, nature appreciation, and activities to be close to or see the species, such as snorkeling, scuba diving or boat trips.
6.4.	Tourism	‘Tourism is a social, cultural and economic phenomenon which entails the movement of people to countries or places outside their usual environment for personal or business/professional purposes. These people are called visitors and tourism has to do with their activities.’ (United Nations Statistical Commission, 2008, p.1).
6.4.1.	Cultural tourism	Cultural tourism is a type of tourism activity in which the visitor's essential motivation is to learn, discover, experience and consume the tangible and intangible cultural attractions/products in a tourism destination (World Tourism Organization (UNWTO), no date).
6.4.2.	Nature-based tourism	Nature-based tourism encompasses the different types of ‘leisure travel undertaken largely or solely for the purpose of enjoying natural attractions and engaging in a variety of outdoor activities’ (Olafsdottir, 2013), which for this framework would be tourism centred on engaging with biological diversity and inland-waters due to the presence of a freshwater species. This includes ecotourism, ‘a type of nature-based tourism activity in which the visitor's essential motivation is to observe, learn, discover, experience and appreciate biological and cultural diversity with a responsible attitude to protect the integrity of the ecosystem and enhance the well-being of the local community’(World Tourism Organization (UNWTO), no date).
6.5.	Other recreation or leisure	

7. Creative Expression

7.1.	Visual arts	
7.1.1.	Representation in artworks	The species is depicted in art, ‘the expression or application of creative skill and imagination, typically in visual form such as painting, drawing or sculpture, producing works to be appreciated primarily for their beauty or emotional power’ (Oxford English Dictionary, 2024a).
7.1.2.	Representation in architecture	The species is depicted in architecture, as part of the design or construction of buildings.
7.1.3.	Representation in crafts, artefacts and tools	The species is depicted as part of crafts, artefacts or tools, where crafts are products to which the manual contribution of the artisan is the most substantial component (International Trade Centre, 1997), and tools are devices used to carry out a particular function. This category specifically covers objects where the primary purpose is not to be worn by a human. This differs from category 1.4.1. which includes the use of the body parts of a species in crafts, artefacts and tools, rather than a representation of the species, although it is possible for a significance item to fall in both categories (the species parts are used in creating a representation of that species).
7.1.4.	Representation in costume, clothing and jewellery	The species is depicted in items created by people for use in costume, clothing or jewellery i.e. items where the primary purpose is to be worn by a human. This differs from category 1.4.2. which includes the use of the body parts of a species in costume, clothing and jewellery, rather than a representation of the species, although it is possible for a significance item to fall in both categories (the species parts are used in creating a representation of that species).
7.1.5.	Representation in culinary preparations	The species is depicted in the result of culinary preparations: including directly as food, and as additional parts of dishes that are not necessarily eaten, such as decoration or garnish.
7.1.6.	Other visual arts	
7.2.	Performing arts	
7.2.1.	Music	The species is represented in and/or inspiration for the creation of music. For example, songs, rhymes, chants and instrumental music.

7.2.2.	Dance	The species is represented in and/or inspiration for the creation of dance.
7.2.3.	Theatre	The species is represented in and/or inspiration for dramatic performances that occur live. For example, theatre, pantomime or puppetry.
7.2.4.	Cinema	The species is represented in and/or inspiration for cinema, where cinema is ‘films or movies collectively, considered as an industry, art form or type of entertainment’(Oxford English Dictionary, 2024b).
7.2.5.	Other performing arts	
7.3.	Language arts	
7.3.1.	Literature	The species features in literature from a particular culture, where literature is written works considered collectively (a body of literary works)(Oxford English Dictionary, 2023b).
7.3.2.	Poetry	The species features in poetry from a particular culture, where poetry is ‘composition in verse or some comparable patterned arrangement of language in which the expression of feelings and ideas is given intensity by the use of distinctive style and rhythm’ (Oxford English Dictionary, 2024c).
7.3.3.	Other language arts	
7.4.	Other forms of creative inspiration	

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Table S3: Full List of Illustrative Examples for Each Category

#	Category	Species	People	Description	References
1.	Consumptive Use				
1.1.	Food and culinary heritage				
1.1.1.	Food Security	<i>Tenualosa ilisha</i> , known as ilish	Bengali communities, Bangladesh and India	The illish is widely eaten as a popular food fish in Bengali communities, and is important for food and nutritional security. In Bangladesh, the ilish represents over 12% of fish production and 1% of GDP, highlighting this importance.	Alam, M. M., Haque, M. M., Santi, M., Rahman, M. A., Hasan, N. A., & Mahalder, B. (2025). Current Status of Hilsa (<i>Tenualosa ilisha</i>) Fisheries in Bangladesh and Implications for Future Research and Development. <i>Aquaculture, Fish and Fisheries</i> , 5(1), e70040.
		<i>Anguilla dieffenbachii</i> , known as tuna (general Māori term for freshwater eel) or New Zealand longfin eel	Māori people, New Zealand	The tuna (longfin eel), is important culturally for Māori, including for food, and historically has been important for food security.	Potangaroa, J. (2010). Tuna kuwharuwharu: The longfin eel. Masterton, New Zealand: Rangitāne o Wairarapa. Available online at: https://pukaha.org.nz/wp-content/uploads/2020/05/tuna_kuwharuwharu.pdf
		<i>Crocodylus porosus</i> , known as Bāru	Yolŋu people Arnhem Land in Australia	Yolŋu people have great respect for Saltwater Crocodile and only approve of harvesting and eating them when the community is facing starvation.	Fijn, N. (2013). Living with crocodiles: engagement with a powerful reptilian being. <i>Animal Studies Journal</i> , 2(2), 1-27. https://ro.uow.edu.au/asj/vol2/iss2/2
		<i>Thaeleichthys pacificus</i> , known as halmotkw	Nisda'a First Nations, Canada	The fish is called halmotkw by the Nisda'a First Nations people, which can be translated as 'salvation fish' due to the immense importance of the anadromous run of this fish to Nisada'a food security	MacKinnon, J. B. (2015). "Salvation Fish" That Sustained Native People Now Needs Saving. <i>National Geographic</i> , July. Available online at : https://www.nationalgeographic.com/news/2015/07/150707-salvation-fish-canada-first-nations-animals-conservation-world/
		<i>Pyxicephalus adspersus</i> ,	Pedi, Swati, Tsonga, and	Consumption of Bullfrog species by various indigenous cultures is prevalent in South Africa. Multiple frog species are also consumed	Channing, A., Du Preez, L., & Passmore, N. (1994). Status, vocalization and breeding biology of two species of

#	Category	Species	People	Description	References
		<i>Pyxicephalus beytelli</i> , and <i>Pyxicephalus edulis</i> known as letlametlo in SePedi	Zulu communities (South Africa)	in various other southern African countries, including Angola, Botswana, Mozambique and Namibia.	<p>African bullfrogs (Ranidae: <i>Pyxicephalus</i>). <i>Journal of Zoology</i>, 234(1), 141-148</p> <p>du Preez, L. H., Netherlands, E. C., Rödel, M. O., & Channing, A. (2024). A new bullfrog from southern Africa. <i>African Journal of Herpetology</i>, 73(1), 61-89.</p> <p>Phaka, F. M., Hugé, J., Vanhove, M. P., & du Preez, L. H. (2023). Frog and reptile conservation through the lens of South Africa's nature-based cultural practices. <i>African Journal of Herpetology</i>, 72(2), 190-206.</p> <p>Turner, G. (1987). Hunters and herders of the Okavango Delta, northern Botswana. <i>Botswana Notes & Records</i>, 19(1), 25-40.</p>
		<i>Acipenser fulvescens</i> , known as namä'o and Lake sturgeon	Menominee Nation, North America	<p>The namä'o was of vital importance for both subsistence (especially post-winter) and nutrition (as maple syrup was the other key food at this time of year) to the Menominee people from historical times to the late 1800s. The lands of the Menominee were taken from them in the mid-1800s by settler-colonists, and logging dams limited sturgeon upstream progress, but a concrete dam in 1892 stopped the sturgeon reaching their spawning location, of key cultural importance, Namä'o Uskiwämît. Continued threats from colonists drove the fish to the brink of extinction, and destroyed the Menominee economy depending on the fish. Even after the loss of sturgeons for nearly a century, Menominee people still remembered recipes for cooking fish, showing their substantial cultural importance even in loss. Sturgeon heads for a soup, a special treat for the elders, for example.</p>	<p>Beck, D. R. (1995). Return to Namä'o Uskiwämît: The Importance of Sturgeon in Menominee Indian History. <i>The Wisconsin Magazine of History</i>, 32-48.</p> <p>Tousey, Grignon, Reiter, Cox and Cox (2017) Nama'o The Ancient Story Teller [video]. Schwizer (director). POSOH Project. College of Menominee Nation, Sustainable Development Institute. University of Wisconsin-Madison. Available online at: https://www.youtube.com/watch?v=a_R9E_nueoA</p>


#	Category	Species	People	Description	References
1.1.2.	Nutrition	<i>Bellamya bengalensis</i> and other freshwater snails, known as ghonghi	Tharu people, Nepal	The freshwater snails called 'ghonghi' are an important cultural food for Tharu people, and an important source of protein both historically and today. Some people say eating ghonghi is one of the reasons Tharu people have some resistance to malaria.	Tharu Cultural Museum and Research Centre, Ratnanagar, Nepal Unpublished ethnographic and interview data (Griffith 2023, 2025)
		<i>Tenuaosa ilisha</i> , known as ilish	Bengali communities, Bangladesh and India	The ilish is widely eaten as a popular food fish in Bengali communities, and is important for food and nutritional security. Nutritionally, it is rich in omega-3 fatty acids. In Bangladesh, the ilish represents over 12% of fish production and 1% of GDP, highlighting this importance.	Alam, M. M., Haque, M. M., Santi, M., Rahman, M. A., Hasan, N. A., & Mahalder, B. (2025). Current Status of Hilsa (<i>Tenuaosa ilisha</i>) Fisheries in Bangladesh and Implications for Future Research and Development. <i>Aquaculture, Fish and Fisheries</i> , 5(1), e70040.
		<i>Acipenser fulvescens</i> , known as namä'o and Lake sturgeon	Menominee Nation, North America	The namä'o was of vital importance for both subsistence (especially post-winter) and nutrition (as maple syrup was the other key food at this time of year) to the Menominee people from historical times to the late 1800s. The lands of the Menominee were taken from them in the mid-1800s by settler-colonists, and logging dams limited sturgeon upstream progress, but a concrete dam in 1892 stopped the sturgeon reaching their new spawning location, and location of key cultural importance, Namä'o Uskiwämît. Continued threats from colonists - more dams, persecution as a nuisance, then value for caviar, oil and isinglas - drove the fish to the brink of extinction, and destroyed the Menominee economy depending on the fish. Even after the loss of sturgeons for nearly a century, Menominee people still remembered recipes for cooking fish, showing their substantial cultural importance even in loss.	Beck, D. R. (1995). Return to Namä'o Uskiwämît: The Importance of Sturgeon in Menominee Indian History. <i>The Wisconsin Magazine of History</i> , 32-48. Tousey, Grignon, Reiter, Cox and Cox (2017) Nama'o The Ancient Story Teller [video]. Schwizer (director). POSOH Project. College of Menominee Nation, Sustainable Development Institute. University of Wisconsin-Madison. Available online at: https://www.youtube.com/watch?v=_aR9E_nueoA
		<i>Crocodylus niloticus</i> known as the Nile Crocodile	Multiple communities in South Africa	Nile Crocodile are farmed in South Africa for their meat which is sold through select butchereries and restaurants that specialise in wildlife meat. Some of this crocodile meat is exported.	Van Jaarsveldt, K. R. (1992). <i>The skin trade: past, present and future. Conservation and utilization of the Nile Crocodile in South Africa</i> . Handbook on Crocodile farming, Ed by Smith GA and Marais J, The Crocodilian Study Group of South Africa, pp 155-159.

#	Category	Species	People	Description	References
		<i>Crocodylus niloticus</i> , known as kwena	BaPedi people of South Africa	Kwena are opportunistically harvested (while hunting for small game) and eaten by South Africa's BaPedi people.	Phaka, F. M., Hugé, J., Vanhove, M. P., & du Preez, L. H. (2023). Frog and reptile conservation through the lens of South Africa's nature-based cultural practices. <i>African Journal of Herpetology</i> , 72(2), 190-206. https://hdl.handle.net/10520/ejc-ajherp_v72_n2_a190
		<i>Crocodylus niloticus</i> , known as ngwenya or ingwenya	AmaNdebele and Amazulu people of South Africa	AmaNdebele and AmaZulu people of South Africa opportunistically harvest and eat Nile Crocodile.	Phaka, F. M., Hugé, J., Vanhove, M. P., & du Preez, L. H. (2023). Frog and reptile conservation through the lens of South Africa's nature-based cultural practices. <i>African Journal of Herpetology</i> , 72(2), 190-206.
		<i>Thaleichthys pacificus</i> , known as sputc or eulachon	Nuxalk Nation, Canada	The sputc (eulachon) is important as a cultural food, especially the nutrition provided from its 'grease' (fish oil) which provides fatty acids, omega-3, retinol and vitamin A.	Beveridge, R. (2019). <i>Standing up for sputc: the Nuxalk Sputc Project, eulachon management and well-being</i> . Doctoral dissertation. University of Victoria
1.1.3.	Delicacies	<i>Ambystoma mexicanum</i> , known as Axolotl	Aztecs of Central Mexico (historical)	The Aztecs considered axolotls to be a delicacy with aphrodisiac properties and also a food for the gods.	Valerio-Holguín, F. (2017). Axolotl: Pre-Hispanic Delicacy, Rejected Monster, and Reclaimed Wonder of Science and Literature. In <i>Offal: Rejected and Reclaimed Food</i> . Proceedings of the Oxford Symposium on Food and Cookery 2016.
		<i>Tenualosa ilisha</i> , ilish	Bengali communities, Bangladesh and India	The ilish is widely eaten as a popular food fish in Bengali communities, where it is regarded as a delicacy.	Alam, M. M., Haque, M. M., Santi, M., Rahman, M. A., Hasan, N. A., & Mahalder, B. (2025). Current Status of Hilsa (<i>Tenualosa ilisha</i>) Fisheries in Bangladesh and Implications for Future Research and Development. <i>Aquaculture, Fish and Fisheries</i> , 5(1), e70040.
		<i>Tenualosa ilisha</i> , palla	Sindhi communities, including Mallah people, Pakistan	Palla is widely eaten as a popular food fish in Sindhi communities, where it is regarded as a delicacy. It is believed the Palla migrate (as a pilgrimage) around the shrine of Khizr in Rohri, and hence acquire their unique and delicious taste. For this reason, Palla from aquaculture are not thought to have the same taste.	Jatt, Z. R. (2023). Lord of the River: An Outline of Khwaja Khizr's Worship in the Indo-Pak Subcontinent with a Focus on Sindh. In <i>Inter-religious Practices and Saint Veneration in the Muslim World</i> (pp. 241-260). Routledge.


#	Category	Species	People	Description	References
		<i>Fejervarya cancrivora</i> (Crab eating Frog), <i>Limnonectes macrodon</i> (Malaya Wart Frog), <i>Lithobates catesbeianus</i> (American Bullfrog), and several other anuran species	French and Belgian mainstream culture, and communities in other European countries and the USA. Locally in some Asian countries.	Frog legs are haute cuisine in French and Belgian cuisine which are the major consumers and importers, but are also eaten as haute cuisine in other European countries and the USA, where they are imported from exporter countries, mostly in Asia. The species are also consumed locally in exporter countries.	Auliya, M., Altherr, S., Nithart, C., Hughes, A., & Bickford, D. (2023). Numerous uncertainties in the multifaceted global trade in frogs' legs with the EU as the major consumer. <i>Nature Conservation</i> , 51, 71. Warkentin, I. G., Bickford, D., Sodhi, N. S., & Bradshaw, C. J. (2009). Eating frogs to extinction. <i>Conservation Biology</i> , 23(4), 1056-1059.
		<i>Malaclemys terrapin</i> , known as Diamondback terrapin.	Communities in various states of the USA	Diamondback terrapin were heavily consumed as a delicacy up to the early 1900s but law enforcement has since decreased their consumption considerably. In 2016 there were still reports of harvesting Diamondback terrapin in USA.	Basile, E. R., Avery, H. W., Bien, W. F., & Keller, J. M. (2011). Diamondback terrapins as indicator species of persistent organic pollutants: using Barnegat Bay, New Jersey as a case study. <i>Chemosphere</i> , 82(1), 137-144. Sherwood, N., Wu, M., & Weis, P. (2018). Mercury contamination in diamondback terrapins in New Jersey. <i>Environmental management</i> , 62, 756-765.
		<i>Andrias spp.</i> known by many different names, including 中國大鯢, (Zhōngguó dà ní, Chinese Giant Salamander) 、娃娃鱼 (wáwáyú)		There are a very wide range of local traditions associated with the species in different cultures across the distribution of the Chinese Giant Salamander in China, and therefore complex patterns of local consumption. However, generally, there has been extensive consumption of the species across in range. In particular, in urban areas the consumption of the salamander, as a rare, expensive and luxury food item, is seen a delicacy and luxury. Due to overharvesting the species is likely close to extinction in the wild.	Turvey, S. T., Chen, S., Tapley, B., Liang, Z., Wei, G., Yang, J., Wang, J., Wu, M., Redbond, J., Brown, T., & Cunningham, A. A. (2021). From dirty to delicacy? Changing exploitation in China threatens the world's largest amphibians. <i>People and Nature</i> , 3(2), 446–456. https://doi.org/10.1002/PAN3.10185/SUPPINFO

#	Category	Species	People	Description	References
		<i>Sicyopterus spp</i> , known as manda	Manda or Glako in Guale and Isabel Islands	Post larvae of amphidromous gobies coming ashore after their oceanic cycle are harvested. They are a delicacy for people from some islands in the Solomon Islands.	Keith, P., Boseto, D., & Lord, C. (2021). Freshwater Fish of the Solomon Islands. Société Française d'Ichtyologie (SFI). Unpublished data (Hevalao 2025)
		<i>Caiman crocodilus</i> (Spectacled Caiman) <i>Crocodylus siamensis</i> and <i>Crocodylus porosus</i> Siamese and Saltwater crocodile, respectively	People in Guangzhou and Zhanjiang, China	Spectacled Caiman, Siamese Crocodile and Saltwater Crocodile were found in dried food products from seafood shops in Guangzhou and Zhanjiang in China.	Zhang, X., Armani, A., Giusti, A., Wen, J., Fan, S., & Ying, X. (2021). Molecular authentication of crocodile dried food products (meat and feet) and skin sold on the Chinese market: implication for the European market in the light of the new legislation on reptile meat. Food Control, 124, 107884. https://doi.org/10.1016/j.foodcont.2021.107884
		<i>Crocodylus johnstoni</i> (Freshwater Crocodile) and <i>Crocodylus porosus</i> (Saltwater Crocodile)	Communities in Australia	Saltwater Crocodile and Australian Freshwater Crocodile are farmed in Australia for their meat.	Warfield, B., Ford, A., & Mitchell, G. E. (1996). <i>Crocodile meat industry report: Market development & product specification</i> . Queensland Department of Primary Industries.
		<i>Hoplias aimara</i> known as Aymara	Multiple communities in French Guiana	The Aymara is caught and eaten as a delicacy for many communities in French Guiana, including but not limited to Kali'na and Wayana, Saramaka, Creole and metropolitan French communities. The flesh is believed to be delicious. However, mercury contamination from eating the fish is a major risk, and present throughout French Guiana due to artisanal gold mining releasing methylmercury that bioaccumulates in top-level predators like the Aymara.	Unpublished interview data (Griffith and Mangione 2024) Maury-Brachet, R., Gentes, S., Dassié, E. P., Feurtet-Mazel, A., Vigouroux, R., Laperche, V., ... & Legeay, A. (2020). Mercury contamination levels in the bioindicator piscivorous fish <i>Hoplias aimara</i> in French Guiana rivers: mapping for risk assessment. <i>Environmental Science and Pollution Research</i> , 27, 3624-3636.

#	Category	Species	People	Description	References
		<i>Acipenser fulvescens</i> , known as lake sturgeon	Fishers from US settler communities post 1860	Lake sturgeon were overexploited for their flesh and caviar from the 1860s until populations were decimated.	Harkness, W. J. K., & Dymond, J. R. (1961). <i>The lake sturgeon: the history of its fishery and problems of conservation</i> . Fish & Wildlife Branch, Ontario Department of Lands and Forests.
1.1.4.	Consumption in ritual or social practices	<i>Tenualosa ilisha</i> , known as palla	Sindhi communities, Pakistan	Palla is a particularly prized food fish in Sindhi communities of Pakistan, and in particular will be offered as a dish to guests, as a sign of honour and respect.	Unpublished interview data (Griffith 2023)
		<i>Tenualosa ilisha</i> , known as palla	Mallah people, Pakistan	"In Sindh, it is a common practice to go to a shrine and pray to grant a wish and if the wish is granted, the women would bring Palla as an offering and a thanksgiving gesture." (Jatt 2023)	Jatt, Z. R. (2023). Lord of the River: An Outline of Khwaja Khizr's Worship in the Indo-Pak Subcontinent with a Focus on Sindh. In <i>Inter-religious Practices and Saint Veneration in the Muslim World</i> (pp. 241-260). Routledge.
		<i>Tenualosa ilisha</i> , known as ilish	Bengali communities, Bangladesh and India	The ilish is widely eaten as a popular food fish in Bengali communities. The species has multiple roles in different ritual and social practices: "On the first day of the Bengali year, Pahela Baisakh, a non-sectarian and universal festival of the Bengali nation, is celebrated with a special menu of 'Fermented Rice and Hilsa' (Bengali meaning 'Panta-Ilish')... Bengali Hindu families devote a 'pair of hilsa' (Jora-Ilish) fish to the deity during their most religious festivals, especially worship, and without it, they believe that the worship remains incomplete. Moreover, an important occasion for them is 'Jamai Sashti', when a son-in-law (daughter's husband) enters the house of his prospective parents-in-law, and he is traditionally fed with dishes prepared with hilsa. Festivals of this fish are also sporadically held in different parts of Bangladesh, such as the 'Chaturanga Hilsa Festival' held for 3 days every year by the Chaturanga Cultural Organisation in Chandpur District City, where the main components of the event include hilsa recipes and art competitions" (Alam et al 2025 referencing Sharma et al 2019)	<p>Alam, M. M., Haque, M. M., Santi, M., Rahman, M. A., Hasan, N. A., & Mahalder, B. (2025). Current Status of Hilsa (<i>Tenualosa ilisha</i>) Fisheries in Bangladesh and Implications for Future Research and Development. <i>Aquaculture, Fish and Fisheries</i>, 5(1), e70040.</p> <p>Sharma, A. P., N. C. Roy, and B. K. Barman. 2019. "Social, Cultural and Religious Importance of Hilsa." In <i>Hilsa: Status of Fishery and Potential for Aquaculture</i>, edited by M. A. Wahab, M. C. M. Beveridge, and M. J. Phillips, 196. Penang: WorldFish.</p>

#	Category	Species	People	Description	References
		<i>Oncorhynchus</i> spp., known as <i>chep</i> , and Pacific salmon	Ainu People, Hokkaido, Japan	<p>The first salmon of the season (as salmon begin their upstream migration) is received and welcomed in a ceremony known as Asircepnomi or Kamuycepnomi.</p> <p>Kosaka (2018) says: “In 1982, after a 100-year interval, the wood carver Shigeo Toyokawa, who was a descendant of one of the Sapporo Ainu villages that had disappeared in the 1880s, in conjunction with Shōji Yūki, an activist for the restitution of Ainu rights, restored the Ainu ritual, Asircepnomi, to receive the first salmon of the season on the riverbanks of the Toyohira River (Figure 5). Toyokawa negotiated with the Hokkaidō prefecture government and succeeded in 1986 in being allowed to catch salmon in the river for this traditional ritual. Following Sapporo, this ritual was restored in Chitose, Asahikawa and Shiraoi, amongst other places, under the name of either Asircepnomi or Kamuycepnomi. Though the right to catch salmon has been restricted to ritual events, I appreciate that the restoration of ritual is an advancement towards the restitution of the Indigenous people. I think the Ainu people can demand further Indigenous rights to catch salmon to maintain their lifestyle, in other words, demand for the right to exist, because their ancestors depended on salmon for their survival before the Japanese Government annexed Hokkaidō”</p>	<p>Kosaka, Y. (2018). Revival of Salmon Resources and Restoration of a Traditional Ritual of the Ainu, the Indigenous People of Japan. In G. Roche, H. Maruyama, & A. V. Kroik (Eds.), <i>Indigenous Efflorescence: Beyond Revitalisation in Sapmi and Ainu Mosir</i> (p. 69). Australian National University Press.</p>
		<i>Neolissochilus hexagonolepis</i> , known as Katlae	Newari people, Nepal	<p>During a Newari wedding ceremony, it is traditional for the bride and groom to be offered fish, dressed in special wedding attire ‘maatcha ko luga’ (‘fish clothes’). The couple will then eat the fish. Traditionally this fish would be Katlae, but as the species has become more rare, the species is often replaced with farmed fish such as carp.</p>	<p>Unpublished interview data (Griffith 2023)</p> 

#	Category	Species	People	Description	References
		<i>Acipenser fulvescens</i> , known as namä'o and Lake sturgeon	Menominee Nation, North America	<p>The celebration for the first Sturgeon arrival at Namä'o Uskiwämî (a waterfall) is held by the Menominee people and involves traditional opening ceremonies, welcomings, speeches and performance of the Fish Dance. There is a feast including sturgeon and wild rice. This was a particularly important time for the Menominee historically, as the namä'o comes upstream to spawn in spring, providing vital food at the end of harsh winters. In 1993 this festival was held again after an absence of sturgeon in Menominee waters of over a century, at which event the family who had continued to offer prayers and ceremonies to the sturgeon during this absence was recognised.</p> <p>One menominee elder (reported in Beck 1995) said "When the sturgeon came up the Wol River to the falls some sturgeon were taken for a ceremonial feast... spiritually and culturally there is significance in all Menominee feasts. Like the sturgeon, Menominee live by cycles. The feasts, for example, occurred during the most opportune moment for the taking of the sturgeons based upon the sturgeon's cycle of reproduction. Offerings are always made in the way of prayer of thanks and tobacco out of respect for allowing the people to take the sturgeon. The prayers were to maintain balance, peace and harmony in their environment and nature."</p>	<p>Beck, D. R. (1995). Return to Namä'o Uskiwämî: The Importance of Sturgeon in Menominee Indian History. <i>The Wisconsin Magazine of History</i>, 32-48.</p> <p>Tousey, Grignon, Reiter, Cox and Cox (2017) Nama'o The Ancient Story Teller [video]. Schwizer (director). POSOH Project. College of Menominee Nation, Sustainable Development Institute. University of Wisconsin-Madison. Available online at: https://www.youtube.com/watch?v=aR9E_nueoA</p>
		<i>Oncorhynchus keta</i>	Ainu people, Japan	The first salmon of the season is received in the ritual known as Asircepnomi or Kamuycepnomi. Practiced again despite many decades of criminalisation of this traditional ceremony, there is ongoing activism to restore Ainu rights to traditional salmon fishing beyond these ceremonies	Kosaka, Y. (2018). Revival of Salmon Resources and Restoration of a Traditional Ritual of the Ainu, the Indigenous People of Japan. <i>Indigenous Efflorescence: beyond revitalisation in Sapmi and Ainu Mosir</i> . Australian University Press, Acton, Australia.
		<i>Anguilla dieffenbachii</i> , known as tuna or New Zealand longfin eel	Māori people, New Zealand	The tuna (longfin eel), is important as a cultural food for Māori, seen as a gift from god. The continued practices of capture and consumption of tuna is "an important part of preserving the practice of cultural traditions", and viewed by many as a delicious meal.	Potangaroa, J. (2010). Tuna kuwharuwharu: The longfin eel. Masterton, New Zealand: Rangitāne o Wairarapa. Available online at: https://pukaha.org.nz/wp-content/uploads/2020/05/tuna_kuwharuwharu.pdf

#	Category	Species	People	Description	References
1.1.5.	Incidental/additional capture	<i>Crocodylus niloticus</i> known as Nile crocodile	Traditional hunters in South Africa	Hunting wildlife meat for sustenance (food security) by some South African indigenous communities targets small mammals and ground-dwelling birds, but Nile crocodiles will also be harvested if encountered during hunting trips.	Unpublished interview and ethnographic data (Phaka 2022)
		<i>Pyxicephalus adspersus</i> , known as letlamelo	BaPedi people of Moletji village, South Africa	Letlamelo was found as bycatch in a noose trap meant for small mammals and birds.	Observation (Phaka 2024) 
1.1.6.	Food processing and preservation	<i>Acipenser</i> spp. and <i>Huso huso</i> , known as sturgeon	Great Britain and Ireland, primarily before the 18 th century	Prior to 1795, isinglas was made from sturgeon swim bladders, and was used in the clarification of beers and other fermented drinks. Therefore sturgeon isinglas is important in the history of British and Irish culinary heritage, as traditional beers and stouts are highly culturally valued drinks in both nations. Isinglas, mostly from marine fish like cod and later tropical species, was used in brewing in many iconic and culturally important beers and stouts in the two countries for centuries. For example, isinglas was used in the iconic Irish stout Guinness until 2018.	Appleby, J. H. (1986). Humphrey Jackson, FRS, 1717-1801: a pioneering chemist. Notes and Records of the Royal Society of London. Vol. 40, No. 2 (May, 1986), pp. 147-168 Jackson, H (1765) An Essay on British Isinglass . London :Printed for J. Newbery, 1765.
		<i>Acipenser fulvescens</i> , known as lake sturgeon	US settler communities and mainstream culture post 1860	Lake sturgeon were overexploited for their isinglass, which was used in making jellies, glues and other forms of food processing	Harkness, W. J. K., & Dymond, J. R. (1961). <i>The lake sturgeon: the history of its fishery and problems of conservation</i> . Fish & Wildlife Branch, Ontario Department of Lands and Forests.



#	Category	Species	People	Description	References
1.2.	Knowledge related to capture				
1.2.1.	Tracking, locating and attracting knowledge	<i>Anguilla bengalensis</i> , known as Rajabaam	Tharu fishers, Chitwan, Nepal	One traditional method of attracting eels in order to be able to catch them that is practiced by fishers of the Tharu people in Chitwan, Nepal, is to make a pile of stones in a stream or river. The pile is then left for a week or two. The fishers then return, surround the pile with nets, and throw the rocks on to the shore one by one. Any eels that have taken up residence in the stone pile are left in the net, and can then be removed and eaten.	Unpublished interview and ethnographic data (Griffith 2025)
		<i>Sicyopterus spp</i> , known as manda	Manda or Glako in Guale and Isabel Islands	Post larvae of amphidromous gobies coming ashore after their oceanic cycle are harvested as a delicacy for some islands in Solomon Islands. The harvest depends on knowledge of the moons waxing and waning, and different groups harvest differently. The harvest takes about 3-5 days.	Keith, P., Boseto, D., & Lord, C. (2021). Freshwater Fish of the Solomon Islands. Société Française d'Ichtyologie (SFI). Unpublished data (Hevalao 2025)
1.2.2	Capturing knowledge	<i>Anguilla spp</i> , known as tuna (one te reo Māori name for freshwater eels)	Māori people, New Zealand	The construction of Māori eel traps called Hīnaki is a traditional capture method, that requires a high degree of skill to weave flexible vines into an eel pot, that once the eel enters, it can no longer escape. Hīnaki would be attached to pa tuna (eel weirs) to catch substantial numbers of eel.	Te Papa Tongarewa (Museum of New Zealand) (n.d.) Hīnaki (eel trap). Object ME008102. Part of Taonga Māori collection. Available online at: Hīnaki (eel trap) Collections Online - Museum of New Zealand Te Papa Tongarewa . Accessed 10.02.2025.
		<i>Arapaima gigas</i> , known as Pirarucu	São Benedito community of the Ilha do Ituqui, Brazil	The "çaçada" (hunting) of the fish holds a particular mystique, and gives fishers prestige in their community. Arapaima fishing requires a lot of patience and a high degree of skill, because of the great size, strength and famous "inteligência" of the Arapaima. New and easier methods of Arapaima fishing are strongly condemned by most of the older fishermen and many of them think that the catching of an Arapaima in the traditional way (with a harpoon, hástea, and the hook with line) earns the fisherman a high standing.	Murrieta, R.S.S. (2001) 'A mística do Pirarucu: pesca, ethos e paisagem em comunidades rurais do baixo Amazonas', Horizontes Antropológicos, 7, pp. 113–130. Available at: https://doi.org/10.1590/S0104-71832001000200006 . Murrieta, R. S. S., & Dufour, D. L. (2004). Fish and farinha: protein and energy consumption in Amazonian rural communities on Ituqui Island, Brazil. Ecology of Food and Nutrition, 43(3), 231-255.

#	Category	Species	People	Description	References
1.2.3.	Killing knowledge	<i>Lithobates catesbeianus</i> , American Bullfrog	People in various states of USA	In some parts of USA frogs are hunted using multipronged spears called 'gigs' and this practice is called gigging. Giggers, people who participate in the seasonal hunting of frogs using a gig, scout forest ponds before midnight. They then proceed to canoe or wade to the targets which they spear and place in harvest baskets. Torches are used to light their way.	<p>Solankar, S. (2022). Looking Into the World of Frog Gigging. https://www.sapiens.org/culture/frog-gigging/ [Accessed: 09.04.2025]</p> <p>Luu, Q. H., Fiedler, T., & Gladysz, J. A. (2017). Gigging Benzene. <i>Angewandte Chemie International Edition</i>, 56(21), 5664-5666.</p>
		<i>Oncorhynchus</i> spp., known as <i>chep</i> , and Pacific salmon	Ainu People, Hokkaido, Japan	<p>Salmon captured by Ainu should be killed using "head knocking sticks" (isapa-kik-ni; lit. "wood to knock his head") by Ainu to kill the caught salmon. This rule is important, as salmon prefer being killed with the ceremonial isapa-kik-ni (often made of willow), and can then allow the spirit from the salmon to return to the gods world: salmon will then return later to be caught and killed again. A narrative account of this information is conveyed in divine songs of the Ainu (oral tradition) which outline in the song the proper ways in which salmon should be killed, and the consequences of not obeying.</p> <p>Kosaka (2018) says: "An Ainu oral tradition tells of the God Who Controls Hunting Lands being informed that a human village was suffering from famine. When the god inquired the reason from another god whose spirit possesses the salmon, and from yet another god whose spirit possesses the deer, the God of Salmon answered that humans had forgotten to use a particular wooden stick when killing the salmon, which allows their souls to return to the gods' world. Meanwhile, the God of Deer replied, 'Humans have forgotten to worship the soul of deer, so I stopped supplying them to the human land' (Nabesawa 1998: 83). Following the counsel of the God Who Controls Hunting Lands, humans resumed abiding by their traditional protocols for taking wildlife, and both gods came to forgive humans and supply salmon and deer again."</p>	<p>Kosaka, Y. (2018). Revival of Salmon Resources and Restoration of a Traditional Ritual of the Ainu, the Indigenous People of Japan. In G. Roche, H. Maruyama, & A. V. Kroik (Eds.), <i>Indigenous Efflorescence: Beyond Revitalisation in Sapmi and Ainu Mosir</i> (p. 69). Australian National University Press.</p> <p>Wilhelm, J. H. (1999). Traditional Ecological Knowledge in the Beliefs of Japanese Fishing Villages: With Special Reference to Yoriiso (Miyagi) and the Sanriku Region. <i>Japanese Religions</i>, 30(1 & 2), 21–53.</p> <p>Nabesawa, Nepki. 1998. 'Kariba o Tsukasadoru Kami to Okikurmi' [The God Who Controls Hunting Lands and Okikurmi]. In Kayano Shigeru no Shinwa Shūsei Vol. 3 [A collection of Ainu myths by Shigeru Kayano], edited by Shigeru Kayano, 74–89: Tokyo: Heibonsha</p> <p>Yamada, H. (2013). The "Master of Animals" Concept of the Ainu. <i>Cosmos</i>, 29, 127–140.</p>

#	Category	Species	People	Description	References
1.3.	Healing and pharmacological systems				
1.3.1.	Traditional medicine and other healing systems	<i>Chaca chaca</i> , known as Kurkuri	Karbi people, India	This fish is prescribed to be eaten to treat polio: the dried fish is boiled or cooked with vegetables and spices	Gupta, T., & Dey, M. (2017). Ichthyotherapy: use of fishes as medicine by ethnic Karbi people of Assam, India. <i>European Journal of Pharmaceutical and Medical Research</i> , 4(10), 341-343.
		<i>Schismaderma carens</i> , known as red toad	Traditional medicine users, Johannesburg, South Africa	Red toads are sold in traditional medicine markets	Whiting, M. J., Williams, V. L., & Hibbitts, T. J. (2011). Animals traded for traditional medicine at the Faraday market in South Africa: species diversity and conservation implications. <i>Journal of Zoology</i> , 2(284):84–96. https://doi.org/10.1111/j.1469-7998.2010.00784.x
		<i>Electrophorus electricus</i> , poraquê	Fisher families of the Tocantins River, Brazil	Fisher families of the Tocantins river interviewed in the 1980s said that the fat of poraquê / peixe eletrico (electric eel) was used to treat rheumatism, colds, asthma and aches, and is passed, massaged or eaten. Additionally, the electric shocks of the eel are said to treat rheumatism. The meat is seldom consumed.(Begossi and Braga 1992)	Begossi, A. and Braga, F.M.D.S. (1992). Food taboos and folk medicine among fishermen from the Tocantins River (Brazil). <i>Amazoniana</i> 12:101-118
		Anura (Unspecified frog species)	Asthma patients in Singapore	Unspecified frog species are used in food therapies for asthma treatment by some Asthma patients in Singapore's public clinics.	Ng, T. P., Wong, M. L., Hong, C. Y., Koh, K. T. C., & Goh, L. G. (2003). The use of complementary and alternative medicine by asthma patients. <i>QJM: An International Journal of Medicine</i> , 96(10), 747-754. https://doi.org/10.1093/qjmed/hcg121
		<i>Crocodylus</i> spp.	Asthma patients in Singapore	Unspecified crocodile species are used in food therapies for asthma treatment by some Asthma patients in Singapore's public clinics.	Ng, T. P., Wong, M. L., Hong, C. Y., Koh, K. T. C., & Goh, L. G. (2003). The use of complementary and alternative medicine by asthma patients. <i>QJM: An International Journal of Medicine</i> , 96(10), 747-754. https://doi.org/10.1093/qjmed/hcg121

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		<i>Crocodylus niloticus</i> , known as Ngwenya or ngwenya	AmaZulu and AmaXhosa people of South Africa	AmaZulu and AmaXhosa use Nile Crocodile to make poison and potions for strength.	Simelane, T. S., & Kerley, G. I. H. (1997). Recognition of reptiles by Xhosa and Zulu communities in South Africa, with notes on traditional beliefs and uses. <i>African Journal of Herpetology</i> , 46(1), 49-53. https://doi.org/10.1080/21564574.1997.9649975
		<i>Crocodylus niloticus</i> , known as Nile Crocodile	Communities in South Africa	Nile Crocodile specimens are sold in South African traditional medicine markets but there is no specification of which cultural groups are using them.	Whiting, M. J., Williams, V. L., & Hibbitts, T. J. (2013). Animals traded for traditional medicine at the Faraday market in South Africa: species diversity and conservation implications. <i>Animals in traditional folk medicine: implications for conservation</i> , 421-473.
		<i>Crocodylus niloticus</i> , known as Nguenha/Ngwenya	Communities in Mozambique	Nile Crocodile specimens are sold in traditional medicine markets of Maputo, Mozambique but there is no specification of which cultural groups are using them.	Williams, V. L., Moshoeu, T. J., & Alexander, G. J. (2016). Reptiles sold as traditional medicine in Xipamanine and Xiquelene Markets (Maputo, Mozambique). <i>South African Journal of Science</i> , 112(7-8), 1-9. http://dx.doi.org/10.17159/sajs.2016/20150416
		<i>Varanus niloticus</i> , known as Gwahli mati	People of Mozambique	Nile Monitor specimens are sold in traditional medicine markets of Maputo, Mozambique but there is no specification of which cultural groups are using them.	Williams, V. L., Moshoeu, T. J., & Alexander, G. J. (2016). Reptiles sold as traditional medicine in Xipamanine and Xiquelene Markets (Maputo, Mozambique). <i>South African Journal of Science</i> , 112(7-8), 1-9.
		<i>Acipenser fulvescens</i> , known as namä'o and Lake sturgeon	Menominee Nation, North America	Historically, sturgeon were used as medicine, to treat a range of ailments from headaches to tuberculosis	Beck, D. R. (1995). Return to Namä'o Uskíwämît: The Importance of Sturgeon in Menominee Indian History. <i>The Wisconsin Magazine of History</i> , 32-48.
1.3.2	Conventional medicine	<i>Danio rerio</i> , known as the zebrafish	International scientific community	The zebrafish is a model organism in scientific and medical research, including for the testing of pharmaceuticals	Meyers, J. R. (2018). Zebrafish: development of a vertebrate model organism. <i>Current Protocols Essential Laboratory Techniques</i> , 16(1), e19.

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		<i>Xenopus laevis</i> (African Clawed Frog) and <i>Xenopus tropicalis</i> (Western Clawed Frog)	International scientific community	<i>Xenopus laevis</i> and <i>Xenopus tropicalis</i> are common model organisms in research focused on embryogenesis and the modelling of human disease.	Maia, L. A., Velloso, I., & Abreu, J. G. (2017). Advances in the use of <i>Xenopus</i> for successful drug screening. <i>Expert opinion on drug discovery</i> , 12(11), 1153-1159. Nenni, M. J., Fisher, M. E., James-Zorn, C., Pells, T. J., Ponferrada, V., Chu, S., ... & Zorn, A. M. (2019). Xenbase: facilitating the use of <i>Xenopus</i> to model human disease. <i>Frontiers in physiology</i> , 10, 154.
1.3.3	Other pharmacological uses	<i>Phyllomedusa bicolor</i> , known as dow kiet	Matsés people, Peru	Sapo is a drug derived from the secretions of the frog, and taken by Matsés hunters to enhance hunting success	Erspamer, V., Erspamer, G. F., Severini, C., Potenza, R. L., Barra, D., Mignogna, G., & Bianchi, A. (1993). Pharmacological studies of 'sapo' from the frog <i>Phyllomedusa bicolor</i> skin: a drug used by the Peruvian Matses Indians in shamanic hunting practices. <i>Toxicon</i> , 31(9), 1099-1111.
		<i>Phyllomedusa bicolor</i> known as Kambo frog,	Indigenous communities including Katukina, Yawanawa and Kaxinawá People	Kambo is a substance derived from the skin secretions of <i>Phyllomedusa bicolor</i> and which is applied transdermally for purification purposes during cultural rituals, and to ward off 'panema' (bad luck during hunting) . Having originated in indigenous communities in Brazil and Peru, including Katukina, Yawanawa and Kaxinawá) Kambo is widely used in multiple communities throughout South America and further afield today. There are concerns that the popularisation of this practice does not recognise legitimate owners of this knowledge.	Sacco, M. A., Zibetti, A., Bonetta, C. F., Scalise, C., Abenavoli, L., Guarna, F., ... & Aquila, I. (2022). Kambo: Natural drug or potential toxic agent? A literature review of acute poisoning cases. <i>Toxicology reports</i> , 9, 905-913. https://doi.org/10.1016/j.toxrep.2022.04.005 de Lima, E. C., & Labate, B. C. (2007). "Remédio da Ciência" e "Remédio da Alma": os usos da secreção do kambô (<i>Phyllomedusa bicolor</i>) nas cidades 1. <i>Campes</i> , 8(1), 71-90.
		<i>Crocodylus niloticus</i> , known as Ngweṅa	Vhavanḡa people of South Africa	The brain of Nile Crocodile is a key ingredient in making potent poison	Mutshinyalo, T. T., & Siebert, S. J. (2010). Myth as a biodiversity conservation strategy for the Vhavenda, South Africa. <i>Indilinga African Journal of Indigenous Knowledge Systems</i> , 9(2), 151-171. https://hdl.handle.net/10520/EJC61597

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1.4.	Craftsmanship				
1.4.1.	Material from species used in crafts, artefacts or tools	<i>Acipenser</i> spp. and <i>Huso huso</i> , known as sturgeon	European communities, typically monastic, scholarly and upper classes, primarily before the 18 th century	Isinglass was used by medieval illuminators to glue gold dust to manuscripts and by historical and modern art conservators to repair parchment and restore paintings. Prior to 1795 it was made from surgeon swim bladders	Appleby, J. H. (1986). Humphrey Jackson, FRS, 1717-1801: a pioneering chemist. Notes and Records of the Royal Society of London. Vol. 40, No. 2 (May, 1986), pp. 147-168
		<i>Rhinella marina</i> , known as Cane Toad	Australian communities	Cane toad keyring: Cane toad skins in Australia are used to make leather products that are sold to the public.	
		<i>Rhinella marina</i> , known as Cane Toad	Australian communities	Cane toad sculpture: Cane toad skins in Australia are used to make leather products that are sold to the public.	
1.4.2.	Material from species used in costume, clothing, or jewellery	Freshwater pearl mussels including <i>Cristaria plicata</i> , zhou wen guan bang, <i>Hyriopsis cumingi</i> , san jiao bang,	Chinese communities, including mainstream Chinese culture	Freshwater pearls have been used for ornamentation and decoration, including jewelry and amulets for millennia, and widely cultivated in China since at least the 13 th century	Akamatsu, S., Zansheng, L. T., Moses, T. M., & Scarratt, K. (2001). The current status of Chinese freshwater cultured pearls. <i>Gems Gemol</i> , 37(2), 96-113.

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		<i>Crocodylus johnstoni</i> and <i>Crocodylus porosus</i> known as freshwater and saltwater crocodile respectively	Communities in Australia, haute couture and high-end fashion globally	Saltwater Crocodile and Australian Freshwater Crocodile are farmed in Australia for their skins, which are popular worldwide in high-end fashion and haute couture as a luxury leather.	Warfield, B., Ford, A., & Mitchell, G. E. (1996). <i>Crocodile meat industry report: Market development & product specification</i> . Queensland Department of Primary Industries.
		<i>Crocodylus niloticus</i> , known as Nile crocodile	Communities in Southern Africa, haute couture and high-end fashion globally	Nile Crocodile are farmed for their skins which are used to make high-end fashion accessories. Some of these skins are exported and while others are used within Southern African countries.	Van Jaarsveldt, K. R. (1992). <i>The skin trade: past, present and future. Conservation and utilization of the Nile Crocodile in South Africa</i> . Handbook on Crocodile farming, Ed by Smith GA and Marais J, The Crocodilian Study Group of South Africa, pp 155-159.
		<i>Hippopotamus amphibius</i>	Bangala People, Upper Congo (DRC)	Hippopotamus skin was used for cuirasses (armour). Note this knowledge was documented in 1890-1905, and therefore may no longer be practiced or known	Weeks, J. H. (1909). Anthropological notes on the Bangala of the Upper Congo River. The Journal of the Royal Anthropological Institute of Great Britain and Ireland, 39, 416-459.
		<i>Oncorhynchus</i> spp., known as <i>chep</i> , and Pacific salmon	Ainu People, Hokkaido, Japan	Salmon skins are used in the production of traditional Ainu shoes, a practice that has been restored by Nobuko Tsuda using a video archive of Kato Katsuyo making such shoes in Teshikaga in 1988.	Tsuda, N. (2018). Heading towards the Restoration and Transmission of Ainu Culture. In G. Roche, H. Maruyama, & A. V. Kroik (Eds.), <i>Indigenous Efflorescence: Beyond Revitalisation in Sapmi and Ainu Mosir</i> . Australian National University Press.
1.5.	Energy				
1.5.1.	Energy from primary use of species	<i>Thaeleichthy pacificus</i> , known as halmotkw as well as candlefish	Nisda'a First Nations, Canada	The fish is called halmotkw by the Nisda'a First Nations people, who would sometimes practice the use of the dried fish as a candle, a practice that led to the english name 'candlefish' of this smelt.	MacKinnon, J. B. (2015). "Salvation Fish" That Sustained Native People Now Needs Saving. National Geographic, July. Available online at: https://www.nationalgeographic.com/news/2015/07/150707-salvation-fish-canada-first-nations-animals-conservation-world/

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		<i>Podocnemis expansa</i> , known as Tartaruga	Portuguese settlers on the Brazilian Amazon, 18 th -19 th century	The species was extensively exploited for its eggs to produce oil for lighting in the 18 th and 19 th century	Smith, N. J. (1979). Aquatic turtles of Amazonia: an endangered resource. <i>Biological Conservation</i> , 16(3), 165-176.
		<i>Acipenser fulvescens</i> , known as lake sturgeon	Fishers from US settler communities prior to 1860	Lake sturgeon, removed due to their perception as a 'nuisance species' were sometimes dried on the shore, and then used to fire steamboat boilers. This was until the mid-1800s, when the value of the meat, caviar and isinglass of the species became apparent.	Harkness, W. J. K., & Dymond, J. R. (1961). <i>The lake sturgeon: the history of its fishery and problems of conservation</i> . Fish & Wildlife Branch, Ontario Department of Lands and Forests.
1.5.2.	Energy from secondary use of species	<i>Bubalus arnee</i> , wild water buffalo, and <i>Bubalus bubalis</i> , domesticated water buffalo	India	Domestic water buffalo dung is used as a fuel in India, where it is burnt. The particular properties of dung as a fuel can be important for particular practices. For example, the steady, long-lasting, low-temperate of fire from dung is good for production of dahi (curd), keeping the fermenting milk warm but not boiling.	Gur-Arieh, S., & Madella, M. (2024). Beyond identification: Human use of animal dung in the past. <i>Journal of Anthropological Archaeology</i> , 75, 101601.
1.6	Companionship and decoration				
		<i>Scleopages formosus</i> , 龍魚, lóng yú, Asian arowana	Chinese people	In recent decades, this species has become the most popular and expensive aquarium fish in China, being believed to bring luck and prosperity to those who keep the fish as a pet. This is due to the resemblance of the species to the Chinese dragon, and the red and gold colouration, all of which are lucky in China. There are multiple other beliefs about the species, such as that it will give its life to save the life of its owner.	Voigt, E. (2016). <i>The Dragon Behind the Glass: A True Story of Power, Obsession, and the World's Most Coveted Fish</i> . Simon and Schuster.
		<i>Betta splendens</i> , known as Pla kat ปลาแคต, Siamese fighting fish	Thai people	The pla kat is widely kept as a pet in Thailand and worldwide. The species has become a national icon in Thailand, including as the National Aquatic Animal, due to its important cultural role in fish fighting. Two male pla kat are placed together, and they will fight, the winning fish in the fight winning the match. The result can be bet upon. The species has been domesticated and captive bred to enhance its utility for this fighting sport, with the knowledge and skills on breeding and keeping the fish passed down generationally.	Portugal, S. J. (2023). Siamese fighting fish. <i>Current Biology</i> , 33(9), R341-R343. Thailand Foundation (2020) Siamese Fighting Fish. Available online at: Siamese Fighting Fish – Thailand Foundation

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1.7	Labour				
		<i>Bubalus arnee</i> , and descendent <i>Bubalus bubalis</i> , domesticated water buffalos	Throughout Asia	The two types of domesticated water buffalo, swamp and river, descend from two separate domestication events, one in South Asia and China/Indochina from the wild water buffalo. Domestic buffalo are important for draught power, milk and/or meat in at least 67 countries	Zhang, Y., Colli, L., & Barker, J. S. F. (2020). Asian water buffalo: domestication, history and genetics. <i>Animal genetics</i> , 51(2), 177-191.
1.8	Non-use removal				
		<i>Atractosteus spatula</i> , known as alligator gar	Recreational fishers in the USA	Alligator gar have been viewed in recreational fishing communities in the USA as detrimental to ‘game fishes’ and have been persecuted to the point of eradication in some areas due to this perceived threat to the preferred fishes of anglers.	Smith, N. G., Daugherty, D. J., Brinkman, E. L., Wegener, M. G., Kreiser, B. R., Ferrara, A. M., Kimmel, K. D., & David, S. R. (2020). Advances in Conservation and Management of the Alligator Gar: A Synthesis of Current Knowledge and Introduction to a Special Section. <i>North American Journal of Fisheries Management</i> , 40(3), 527–543. https://doi.org/10.1002/NAFM.10369
		<i>Acipenser fulvescens</i> , known as lake sturgeon	Fishers from US settler communities prior to 1860	Commercial fishers from US settler communities historically (pre 1860) viewed the lake sturgeon as a nuisance species, and therefore many sturgeons were persecuted through non-use removal	Harkness, W. J. K., & Dymond, J. R. (1961). <i>The lake sturgeon: the history of its fishery and problems of conservation</i> . Fish & Wildlife Branch, Ontario Department of Lands and Forests.

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2.	Cultural landscapes, sites and stewardship				
2.1.	Sites and structures				
2.1.1	Ancient and prehistoric (pre-500CE)	<i>Anguilla anguilla</i> known as eel and eascann and <i>Salmo salar</i> , salmon and bradán	Settlements around Lough Neagh, Northern Ireland	The earliest Irish settlement known is the Mesolithic site of Mount Sandel on the River Bann at 9000 years old, suggest a reliance on eel and salmon, which were therefore key to the location of the settlement. The Lough Neagh fishery of eels (a lake upstream on the River Bann) remains important today and has a Protected Geographical Indication.	Woodman, P. C., & Mitchel, N. C. (1993). Human settlement and economy of the Lough Neagh basin. In <i>Lough Neagh: The ecology of a multipurpose water resource</i> (pp. 91-111). Dordrecht: Springer Netherlands.
2.1.2	Post-classical (500CE-1599CE)	<i>Cyprinus carpio</i> , known as Karpfen and carp	Bavarian people, Germany	Small-scale pond landscapes in Bavaria, built and maintained for the farming of carp since the Middle Ages, leading to a cultural landscape listed as Intangible Cultural Heritage of Germany	German Commission for UNESCO (2023) Traditional Carp Pond Culture in Bavaria in Bundesweites Verzeichnis Immaterielles Kulturerbe. Deutsche UNESCO-Kommission, Bonn.
		<i>Cyprinus carpio</i> , known as Karpfen and carp	Saxon people from Moritzburg, Germany	The baroque Moritzburg Castle of Saxony, Germany, has many ponds in the grounds that are used for carp production, with channels connecting the ponds allowing them to be drained to remove the fishes. These ponds date from the early 16 th century, and 22 are still in use today by fishermen, and part of the broader carp-pond culture of the region.	Fleischer, N. (2023) Food and drink from the Elbland region. Dresden Magazin. Available online at https://dresden-magazin.com/en/indulgence/elbland/ (accessed 28.12.23)
2.1.3	Traditional and modern (post-1599CE)	<i>Anguilla bengalensis</i> known as Rajabaam and Indian mottled eel	Magar and other Nepali communities, Tanahun, Nepal	The temple of Chabdi Barahi in Tanahun, Nepal, was first built in 1939CE, to honour the goddess Barahi Devi, who was born from a fish that worshiped the Lord Shiva. It is said the pools were installed earlier, by her son. The first priest of the temple was instructed by Barahi Devi to worship her, and then fell asleep. When he awoke, he found there was a new stone in the pool, which must be the goddess. An eel emerged and swam around the rock, a species he had never seen before, and he realised the eel and the goddess were connected. Today, the eels are a key aspect of worship at the temple, identified as guardians, messengers or incarnations of the goddess. Sacrifices are offered to the eel to ask for success in major life events (and latterly to give thanks), such as Gurkha recruitment or becoming pregnant. It is said if the eel eats the flesh and blood of the sacrifice, the prayer has been heard.	Unpublished ethnographic and interview data (Griffith & Basnet 2024, 2025)

#	Category	Species	People	Description	References
		<i>Acipenser fulvescens</i> , known as namä'o and Lake sturgeon	Menominee Nation, North America	The current location of the Menominee Indian Reservation. Prior to European colonization, the Menominee people occupied a territory of about 10 million acres in what is now Michigan and Wisconsin. As the Menominee had their lands taken by settlers, they eventually became limited to the current site of the Menominee Indian Reservation through a treaty in 1854. A major reason this land was chosen by the Menominee was it contained Namä'o Uskiwämît, translating to the Sturgeon Spawning Place, and is a waterfall of importance for sturgeon spawning (also called Keshena Falls by European-Americans)	Beck, D. R. (1995). Return to Namä'o Uskiwämît: The Importance of Sturgeon in Menominee Indian History. <i>The Wisconsin Magazine of History</i> , 32-48. Tousey, Grignon, Reiter, Cox and Cox (2017) Nama'o The Ancient Story Teller [video]. Schwizer (director). POSOH Project. College of Menominee Nation, Sustainable Development Institute. University of Wisconsin-Madison. Available online at: https://www.youtube.com/watch?v=aR9E_nueoA
		Introduced salmonids, especially <i>Oncorhynchus mykiss</i> known as rainbow trout, and <i>Oncorhynchus kisutch</i> known as Coho salmon	Communities around Lake Llanquihue, Chile	Since the 1970s, the ecosystem of Lake Llanquihue and its contributions to people have been completely altered by purposeful introductions of non-native salmonids for recreational fishing and aquaculture. Beginning in the 1970s, recreational fishing and aquaculture are now multi-million-dollar industries, with much of the local livelihoods and economies geared towards these types of fishery. Introduced species have caused ecological changes, including declines in native species and habitat alteration, leading to concerns from conservationists and some rural communities.	Arismendi, I., & Nahuelhual, L. (2007). Non-native salmon and trout recreational fishing in lake Llanquihue, Southern Chile: Economic benefits and management implications. <i>Reviews in Fisheries Science</i> , 15(4), 311–325. https://doi.org/10.1080/10641260701484655;WGROU:STRING:PUBLICATION Arismendi, I., Soto, D., Penaluna, B., Jara, C., Leal, C., & LeÓN-Muñoz, J. (2009). Aquaculture, non-native salmonid invasions and associated declines of native fishes in Northern Patagonian lakes. <i>Freshwater Biology</i> , 54(5), 1135–1147. https://doi.org/10.1111/J.1365-2427.2008.02157.X
2.2.	Stewardship practices				
2.2.1	Stewardship of target species	<i>Acipenser fulvescens</i> , namä'o	Menominee Nation, North America	The Menominee Nation has a long history of stewarding the culturally important namä'o or lake sturgeon. The Nation today continues this tradition, including participation in co-management with US Wisconsin (state) and federal agencies in the sustainable use and recovery of sturgeon in the Lake Winnebago and Michigan systems, Wisconsin.	Kline, Kathleen Schmitt, Ronald M. Bruch, and Frederick P. Binkowski. <i>People of the sturgeon: Wisconsin's love affair with an ancient fish</i> . Vol. 2. Wisconsin Historical Society, 2009.

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		<i>Anguilla mamorata</i> known as mauvo or puleo	Guadalcanal Guale, including Uluna/Sutahuri tribes in Malanga Region and people in the Malagheti region, Solomon Islands	The eel mauvo/puleo is special to certain tribes, such as Uluna/Sutahuri tribes and people in the Malagheti region; it is believed to keep the rivers and streams flowing and purify them. Eels are seen as guardians of river health, and groups enact stewardship practices such as refraining from harvesting them and strictly protecting them within their rivers and streams.	Unpublished data (Hevalao 2025)
2.2.2	Stewardship of assemblage of species	<i>Anguilla mamorata</i> and other freshwater species of Vanuatu	Yakel tribes of Tana islands, Vanuatu	The Yakel tribe maintains strong kastom beliefs and protects sacred sites, including freshwater springs and river sources. Water sources are often tied to ancestral spirits, and certain areas are tabu (off-limits) for extraction or development.	Unpublished data (Hevalao 2025)
		<i>Abramis brama</i> bream/Brasse, <i>Tinca tinca</i> , tench/Schleie, <i>Rutilus rutilus</i> roach/Plötze, <i>Esox lucius</i> , pike/Hecht, <i>Sander lucioperca</i> Zander and <i>Perca fluviatilis</i> perch/Barsch	Recreational anglers in Lower Saxony, Germany	Recreational anglers (including through fishing clubs, especially the Angler Association of Lower Saxony) in Lower Saxony, Germany, were key participants in a transdisciplinary project to assess forms of stewardship of an assemblage of species important to recreational fishers. Such clubs had been conducting targeted stewardship in the past (such as through stocking) but this co-developed project evaluated the benefits of stocking vs ecosystem restoration in the region for the whole assemblage. The research component by scientists (themselves also recreational fishers) showed ecosystem restoration (i.e. stewardship of water and land) to be central to stewardship of the target assemblage of species, as well as the health of the lakes more broadly.	Radinger, J., Matern, S., Klefoth, T., Wolter, C., Feldhege, F., Monk, C. T., & Arlinghaus, R. (2023). Ecosystem-based management outperforms species-focused stocking for enhancing fish populations. <i>Science</i> , 379(6635), 946–951. https://doi.org/10.1126/SCIENCE.ADF0895/SUPPL_FILE/SCIENCE.ADF0895_MDAR_REPRODUCIBILITY_CHECKLIST.PDF

#	Category	Species	People	Description	References
2.2.3	Stewardship of water and land	<i>Anguilla marmorata</i> and other freshwater species of Vanuatu	Yakel tribes of Tana islands, Vanuatu	The Yakel tribe maintains strong kastom beliefs and protects sacred sites, including freshwater springs and river sources. Water sources are often tied to ancestral spirits, and certain areas are tabu (off-limits) for extraction or development.	Unpublished data (Hevalao 2025)
		Oncorhynchus tshawytscha, nerka and kizhuch, respectively nac'óox (chinook), q'óyxc (sockeye), and k'állay (silver), collectively called salmon	Nimiipuu people (Nez Perce Tribe), USA	The Nimiipuu people have long stewarded the water and lands for salmon species, including that “water must be kept clean. When water is kept cold and clean, it takes care of the salmon” (Nimiipuu elder Levi Holt quoted in Colombi 2012), and in “implementing Nimiipuu knowledge of ridgetop to ridgetop watershed protection and restoration for rearing and spawning habitats and the protection of water quality”. Recommendations for conservation salmon populations from the Nimiipuu and other Columbia basin treaty tribes are outlined in the plan Wy-kan-ush-mi Wa-kish-wit (the spirit of the salmon). The Nimiipuu leaders push for “breaching the four lower Snake river dams”, in an active attempt to restore the free-flowing rivers needed by the salmon and other species.	Colombi, B. J. (2012). Salmon and the adaptive capacity of Nimiipuu (Nez Perce) culture to cope with change. <i>American Indian Quarterly</i> , 36(1), 75-97. FC (Columbia River Inter-Tribal Fish Commission), Wy-kan-ushmi Wa-kish-wit: The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs and Yakama Tribes, 2006, http://www.critfc.org/text/trp.html .
3.	Knowledge systems and transfer				
3.1.	Names				
3.1.1	Folk taxonomies	Amphibians in general	Many communities worldwide, including communities speaking declining and endangered languages	Amphibians across the world have folk names, most of which have still not been documented/studied. Some folk names like axolotl, the name of a paedomorphic salamander originating from the Aztecan language family, have become widely used by speakers of different languages globally.	Personal experience (Phaka)

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		<i>Anguilla anguilla</i>	English speaking people of the UK	<i>Anguilla anguilla</i> is called the ‘eel’ in English, from the old English ‘ael’ and etymologically related to name for eel in other Germanic languages such as aal (Dutch and German). The eel, historically a very culturally important species, has multiple had multiple folk/vernacular names in English for different life stages used since at least the 17 th century, including ‘silver eel’ for the sea-going phase ‘Grigs’ and ‘Elver’ for the young eels moving upriver from the sea. ‘Glass eel’ and ‘yellow eel’ are possibly more recent terms that became popularly used more broadly due to the scientific study of the eels in 19 th century.	Oxford University Press. (n.d.). Eel, n. In Oxford English dictionary. Retrieved Feb 1, 2025, from https://doi.org/10.1093/OED/1061331876 Harper, D. (n.d.) eel (n.). <i>Online Etymology Dictionary</i> [online] Available at: https://www.etymonline.com/word/eel Walton, Izaak (1668). The Compleat Angler or the Contemplative Man’s Recreation. Fourth Edition.
		Anurans of South Africa in general, known collectively as Digwagwa	BaPedi of South Africa	South Africa’s BaPedi people collectively refer to frogs as digwagwa which loosely translates to “those who make a <i>gwa-gwa</i> sound.”	Phaka, F.M., Hugé, J., Razhuanzwo, F., Vanhove, M.P.M. & Du Preez, L.H. In press. Naming South African frogs and reptiles in nine Indigenous languages. <i>African Journal of Herpetology</i> . https://doi.org/10.1080/21564574.2024.2441663
		<i>Breviceps</i> species of South Africa, ‘Nana’ as root of all folk names	Multiple cultural groups South Africa	In many of South Africa’s Indigenous languages the folk name for <i>Breviceps</i> species (Rain Frogs) are based on the root word ‘nana’. The BaPedi people call this frog genus “dinanatswidi” which makes references to their whistle-like advertisement calls	Phaka, F.M., Hugé, J., Razhuanzwo, F., Vanhove, M.P.M. & Du Preez, L.H. In press. Naming South African frogs and reptiles in nine Indigenous languages. <i>African Journal of Herpetology</i> . https://doi.org/10.1080/21564574.2024.2441663
		Andrias spp. known as Chinese Giant Salamander, 娃娃鱼(wáwáyú)		One of the many common names of the Chinese giant salamander is 娃娃鱼 (wáwáyú) which means ‘baby fish’, and is linked to a perceived association with dead babies, and therefore being bad luck and generally a negative cultural value, and in some cases having taboos against eating them.	Turvey, S. T., Chen, S., Tapley, B., Liang, Z., Wei, G., Yang, J., Wang, J., Wu, M., Redbond, J., Brown, T., & Cunningham, A. A. (2021). From dirty to delicacy? Changing exploitation in China threatens the world’s largest amphibians. <i>People and Nature</i> , 3(2), 446–456.
3.1.2	Vocabulary of nature	<i>Anguilla anguilla</i>	English speaking people of the UK	Elver is a corruption of the earlier ‘eelfare’ which literally means ‘passage of young eels up a river’ and therefore once conveyed ecological knowledge.	Harper, D. (n.d.) elver (n.). <i>Online Etymology Dictionary</i> [online] Available at: www.etymonline.com/word/elver

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		<i>Ptychadena anchitae</i> , known as <i>Mabhruku</i>	VaTsonga of South Africa	In South Africa XiTsonga language <i>Ptychadena anchitae</i> (Plain Grass Frogs) are called 'Mabhruku' which borrowed from an Afrikaans word for long pants. This name demonstrates knowledge of this frog's long hindlegs and ability to jump further than most frogs.	Phaka, F.M., Hugé, J., Razhuanzwo, F., Vanhove, M.P.M. & Du Preez, L.H. In press. Naming South African frogs and reptiles in nine Indigenous languages. <i>African Journal of Herpetology</i> .
		<i>Lota lota</i>	English speaking people of the USA	The burbot, <i>Lota lota</i> , is also known as the 'lawyer' or 'lawyer fish' in the USA. The reasons given for the etymology are varied, but always demonstrate a negative cultural connotation of lawyers (as a profession). For example, that burbot are slippery or slimy, that they are bottom feeders or that their heart is positioned near their anus, the humorous suggestion being that these are also features of human lawyers.	Interview data, 2025 Lowe, M. (2019) The Last Burbot in Britain. <i>Animal Bytes</i> . Museum of Zoology University of Cambridge [online]. Available at: https://animalbytescambridge.wordpress.com/2019/09/14/the-last-burbot-in-britain/
		<i>Acipenser fulvescens</i> , known as namä'o and Lake sturgeon	Menominee Nation, North America	Namä'o Uskiwämî, translating to the Sturgeon Spawning Place, is used by the Menominee people to describe a waterfall of importance (also called Keshena Falls by European-Americans)	Beck, D. R. (1995). Return to Namä'o Uskiwämî: The Importance of Sturgeon in Menominee Indian History. <i>The Wisconsin Magazine of History</i> , 32-48.
		<i>Hucho perryi</i> , known as Ito 伊富	Japanese people	The name "Ito" in Japanese is written in Kanji 伊富 using the Chinese-originated characters parts for "fish" and "ogre/demon", reflecting its role in folklore as a monster or demon in the water	Fukushima and Rand (2021), Living with Ito, a critically endangered fish in Japan, Available online at: https://www.youtube.com/watch?v=7wMEQPBUfM8 . Accessed 24.07.23 Ministry of Land, Infrastructure, Transport and Tourism, information sheet, Available online at: https://www.mlit.go.jp/tagengo-db/common/001559050.pdf
		Amphibians and freshwater reptiles	Indigenous people throughout the world	Amphibians and freshwater reptiles are assigned folk names by different Indigenous people. These folk names show how people perceive their local biodiversity and organise it into discrete units. Some of these names demonstrate the knowledge of certain species biology as they are based on a species distinctive traits	Berlin, B., Breedlove, D. E., & Raven, P. H. (1966). Folk taxonomies and biological classification. <i>Science</i> , 154(3746), 273-275. Phaka, F.M., Hugé, J., Razhuanzwo, F., Vanhove, M.P.M. & Du Preez, L.H. In press. Naming South African frogs and reptiles in nine Indigenous languages. <i>African Journal of Herpetology</i> . https://doi.org/10.1080/21564574.2024.2441663

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		<i>Tenualosa ilisha</i> , known as palla	Mallah community of Kotri, Pakistan	Palla are sacred, and as such some Mallah people believe you should not call the species by the Sindhi word machhi, meaning fish. Instead, she should be called only palla / pallo. This is because to call palla a fish would be to undermine the special status of the species.	Jatt, Z. R. (2023). Lord of the River: An Outline of Khwaja Khizr's Worship in the Indo-Pak Subcontinent with a Focus on Sindh. In Inter-religious Practices and Saint Veneration in the Muslim World (pp. 241-260). Routledge.
		<i>Thaeleichthy pacificus</i> , known as halmotkw	Nisda'a First Nations, Canada	The fish is called <i>halmotkw</i> by the Nisda'a First Nations people, which can be translated as 'salvation fish' due to the immense importance of the anadromous run of this fish to Nisada'a food security.	MacKinnon, J. B. (2015). "Salvation Fish" That Sustained Native People Now Needs Saving. National Geographic, July. Available online at : https://www.nationalgeographic.com/news/2015/07/150707-salvation-fish-canada-first-nations-animals-conservation-world/
		<i>Thaeleichthy pacificus</i> , known as candlefish	English-speaking Canadian communities, based on knowledge of the Nisda'a First Nations, Canada	One English name of this smelt is 'candlefish', referring to the ability of this fish to be burnt and used as a candle. This name derived from knowledge of Nisda'a First Nations (and other first Nations), who used the fish as a candle when needed.	MacKinnon, J. B. (2015). "Salvation Fish" That Sustained Native People Now Needs Saving. National Geographic, July. Available online at : https://www.nationalgeographic.com/news/2015/07/150707-salvation-fish-canada-first-nations-animals-conservation-world/
3.1.3	Alternative word usage	<i>Siluriformes</i> known as catfish	English language speakers	The word 'catfish' or 'catfishing' in modern popular culture, is used to refer to a process in which a person pretends to be someone else online in order to deceive someone, typically with malicious intent.	"catfish." (2023) Merriam-Webster.com (accessed 27 Dec 2023)
		<i>Salmo spp. and Oncorhynchus spp.</i> , known as salmon, Lachs, Salmón, Salmó, Salmone	Speakers of English, German, Spanish, French and Italian languages	The word "salmon" is a commonly used word for a light orange to pink color. It is named after the colour of salmon flesh, and its widespread use indicates the widespread consumption of salmon, and knowledge of what salmon flesh looks like. It is used in many languages including: German, English, Spanish, French & Italian.	

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		Anurans in general	English language speakers	Frogging or Chinese frog closure is a term used for a type of ornamental garment closure.	Wikipedia contributors. (n.d.). <i>Frog (fastening)</i> . Wikipedia. https://en.wikipedia.org/wiki/Frog_(fastening) [Accessed: 04.11.2023]
3.2.	Observations				
		<i>Pyxicephalus</i> species (Bullfrogs) and <i>Xenopus</i> species (Clawed Frog)	AmaZulu and VaTsonga of South Africa	Bullfrogs and Clawed Frogs are said to fall from the sky during heavy rain. These frog species are seldom seen in the open. Bullfrogs estivate underground and only emerge to feed and breed during heavy rain events. Clawed frogs are aquatic frogs but will traverse terrestrial habitats to migrate between waterbodies during heavy rain to avoid desiccation and possible predation. Without the knowledge of Bullfrogs' inactive period underground and the Clawed frogs being hidden by water, their somewhat rare occurrence in the open following heavy rain events was interpreted to be them falling with rain.	Phaka, F. M., Netherlands, E. C., Kruger, D. J., & Du Preez, L. H. (2019). Folk taxonomy and indigenous names for frogs in Zululand, South Africa. <i>Journal of ethnobiology and ethnomedicine</i> , 15, 1-8. Phaka, F. M., Hugé, J., Vanhove, M. P., & du Preez, L. H. (2023). Frog and reptile conservation through the lens of South Africa's nature-based cultural practices. <i>African Journal of Herpetology</i> , 72(2), 190-206.
		<i>Ptychadena</i> species (Grass Frogs)	AmaZulu of South Africa	Some species of Grass Frogs are explosive breeders that will start being active moments before the onset of rain. If the observation of a certain type of frog is always followed by rainfall, then its presence might be interpreted as a harbinger of rain hence some Grass Frogs are considered rainmakers in Zulu culture.	Phaka, F. M., Netherlands, E. C., Kruger, D. J., & Du Preez, L. H. (2019). Folk taxonomy and indigenous names for frogs in Zululand, South Africa. <i>Journal of ethnobiology and ethnomedicine</i> , 15, 1-8.
		<i>Pusa sibirica</i> , known as nerpa, khabb and kuma	Lake Baikal seal-hunting communities, including Evenk, Buriat and Russian settlers	Hunters hold extensive knowledge about the behaviour and life history of seals, such as where they live, the seasonality of their life cycle, and specific behaviours such as to remove lice on rocks which stain their coats, as well as on the correct way to behave in relation to nerpa and hunting of the species. For example, that the seals must be shared by hunters according to sharing ethic (khubaaltkha), and to take only as much as needed.	Nomokonova, T., Losey, R. J., Iakunaeva, V. N., Emel'ianova, I. A., Baginova, E. A., & Pastukhov, M. V. (2013). People and seals at Siberia's Lake Baikal. <i>Journal of Ethnobiology</i> , 33(2), 259-280.
		<i>Tenualosa ilisha</i> , known as palla	Mallah community in Kotri, Pakistan	The migration of the palla into freshwater is observed, and is known as the pilgrimage of the palla. It is believed that palla circumambulate the Khwaja Khizr shrine in Bakhar, and touch it with their forehead, leaving a special mark on the heads of the fish as evidence.	Jatt, Z. R. (2023). Lord of the River: An Outline of Khwaja Khizr's Worship in the Indo-Pak Subcontinent with a Focus on Sindh. In <i>Inter-religious Practices and Saint Veneration in the Muslim World</i> (pp. 241-260). Routledge.

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		<i>Acipenser fulvescens</i> , known as namä'o and Lake sturgeon	Menominee Nation, North America	The Namä'o Uskiwämît falls was populated by Sturgeon in spring (when they come here to spawn). There is a drumming sound heard in spring, said to be the music of a "mystic drum belonging to the manitou who owns the cataract" and the beating of the drum calls the sturgeon up to the pools. Once the drum sound is heard the sturgeon then arrive to spawn. This observation of drumming or thunder-like sounds is the noises sturgeons themselves make when they come for spawning, 'sturgeon thunder'. Sturgeons are directly related to Menominee thunder beings and thunder being stories.	Beck, D. R. (1995). Return to Namä'o Uskiwämît: The Importance of Sturgeon in Menominee Indian History. <i>The Wisconsin Magazine of History</i> , 32-48. Bocast, C., Bruch, R. M., & Koenigs, R. P. (2014). Sound production of spawning lake sturgeon (<i>Acipenser fulvescens</i> Rafinesque, 1817) in the Lake Winnebago watershed, Wisconsin, USA. <i>Journal of Applied Ichthyology</i> , 30(6), 1186-1194.
3.3.	Knowledge acquisition				
		<i>Danio rerio</i> , zebrafish	International scientific community	The zebrafish is a model organism in scientific and medical research, including for the testing of pharmaceuticals	Meyers, J. R. (2018). Zebrafish: development of a vertebrate model organism. <i>Current Protocols Essential Laboratory Techniques</i> , 16(1), e19.
		<i>Ambystoma mexicanum</i> , axolotl	International scientific community	The axolotl is a model organism in regeneration biology research	McCusker, C., & Gardiner, D. M. (2011). The axolotl model for regeneration and aging research: a mini-review. <i>Gerontology</i> , 57(6), 565-571.
		<i>Thaleichthys pacificus</i> , sputc or eulachon	Nuxalk Nation (Nuxalkmc), Canada	Sputc is a cultural keystone species to the Nuxalkmc, and the species supports ancestral systems of knowledge. It has been a focus of knowledge generation and refinement over generations, with Nuxalkmc continuing to lead studies on eulachon abundance and biology. Alhqulh ti Sputc (The Eulachon Book) interweaves multiple aspects of knowledge related to Sputc from Nuxalk ways of knowing. Recent work, such as the <i>Sputc Project</i> , has highlighted how the importance of gathering and protecting cultural and ecological knowledges within First Nations communities is often challenged by limited human, financial and educational resources.	Beveridge, R., Moody, M., Murray, G., Darimont, C., & Pauly, B. (2020). The Nuxalk Sputc (Eulachon) project: Strengthening Indigenous management authority through community-driven research. <i>Marine Policy</i> , 119, 103971.

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3.4.	Knowledge transmission				
		<i>Anguilla dieffenbachii</i> , known as tuna (general Māori term for freshwater eel) or New Zealand longfin eel	Māori and non-Māori people, Aotearoa New Zealand	At the Te Nohoaka o Tuikauau wetlands there is a Māori co-led restoration project in the tribal region of Kāi Tahu in Aotearoa New Zealand, involving the intergenerational transfer of both mātauraka Māori and Western science knowledge. “At Te Nohoaka o Tukiauau, rakatahi (youth) are working with cultural experts from Te Rūnaka o Ōtākou, He Waka Kōtuia and freshwater ecologists to monitor local tuna (eel) populations (Figure 4; Ka Hao te Rakatahi, 2019). Part of this research seeks to compare the efficacy of hīnaki (traditional eel nets) and Western fyke nets, while learning the wetland ecology, tuna life cycle and the practices and language associated with mahika kai.” (Rayne et al 2020)	Rayne A, Byrnes G, Collier-Robinson L Ngāi Tahu, Ngāti Apa ki te rā tō, Te Whānau-ā-Apanui, Ngāti Porou, et al. Centring Indigenous knowledge systems to re-imagine conservation translocations. <i>People Nat.</i> 2020; 2: 512–526. https://doi.org/10.1002/pan3.10126
		<i>Xenopus laevis</i> , known as African Clawed Frog)	Biology teachers and lecturers worldwide (formal education systems)	The African Clawed Frog is one of the most used model organisms in biology lessons across the world for dissections and experimental procedures. The species plays a key role in education and therefore knowledge transmission in Western science.	Olive, M., Thiebaud, P., Landry, M., Duvert, M., Verna, A., Barillot, W., & Theze, N. (2003). Using <i>Xenopus</i> as a model system for an undergraduate laboratory course in vertebrate development at the University of Bordeaux, France. <i>International Journal of Developmental Biology</i> , 47(2-3), 153-160. Orlans, F. B. (1980). Selecting an animal for classroom use. <i>The Science Teacher</i> , 47(2), 29-33.
		<i>Oncorhynchus tshawytscha</i> , <i>nerka</i> and <i>kizhuch</i> , respectively nac’óox (chinook), q’óyxc (sockeye), and k’állay (silver)	Nimiipuu people (Nez Perce Tribe), USA	The Nimiipuu people have long stewarded the water and lands for salmon species, which involves the Nimiipuu Indigenous knowledge system of water and salmon, and the interdependency of knowledge, values, landscape and sovereignty in land and salmon. In the plan Wy-kan-ush-mi Wa-kish-wit (the spirit of the salmon) of the Nez Perce, Umatilla, Warm Springs and Yakama tribes (2006) it states “the annual return of the salmon allows the transfer of traditional values from generation to generation; without salmon returning to our rivers and streams, we would cease to be Indian people”.	Colombi, B. J. (2012). Salmon and the adaptive capacity of Nimiipuu (Nez Perce) culture to cope with change. <i>American Indian Quarterly</i> , 36(1), 75-97. FC (Columbia River Inter-Tribal Fish Commission), Wy-kan-ushmi Wa-kish-wit: The Columbia River Anadromous Fish Restoration Plan of the Nez Perce, Umatilla, Warm Springs and Yakama Tribes, 2006, http://www.critfc.org/text/trp.html .

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		<i>Oncorhynchus</i> spp., known as <i>chep</i> , and Pacific salmon	Ainu People, Hokkaido, Japan	<p>Salmon captured by Ainu should be killed using “head knocking sticks” (isapa-kik-ni; lit. “wood to knock his head”) by Ainu to kill the caught salmon. This rule is important, as salmon prefer being killed with the ceremonial isapa-kik-ni (often made of willow), and can then allow the spirit from the salmon to return to the gods world: salmon will then return later to be caught and killed again. A narrative account of this information is conveyed in divine songs of the Ainu (oral tradition) which outline in the song the proper ways in which salmon should be killed, and the consequences of not obeying. This song transmits knowledge intergenerationally.</p> <p>Kosaka (2018) says: “An Ainu oral tradition tells of the God Who Controls Hunting Lands being informed that a human village was suffering from famine. When the god inquired the reason from another god whose spirit possesses the salmon, and from yet another god whose spirit possesses the deer, the God of Salmon answered that humans had forgotten to use a particular wooden stick when killing the salmon, which allows their souls to return to the gods’ world. Meanwhile, the God of Deer replied, ‘Humans have forgotten to worship the soul of deer, so I stopped supplying them to the human land’ (Nabesawa 1998: 83). Following the counsel of the God Who Controls Hunting Lands, humans resumed abiding by their traditional protocols for taking wildlife, and both gods came to forgive humans and supply salmon and deer again.”</p>	<p>Kosaka, Y. (2018). Revival of Salmon Resources and Restoration of a Traditional Ritual of the Ainu, the Indigenous People of Japan. In G. Roche, H. Maruyama, & A. V. Kroik (Eds.), <i>Indigenous Efflorescence: Beyond Revitalisation in Sapmi and Ainu Mosir</i> (p. 69). Australian National University Press.</p> <p>Wilhelm, J. H. (1999). Traditional Ecological Knowledge in the Beliefs of Japanese Fishing Villages: With Special Reference to Yoriiso (Miyagi) and the Sanriku Region. <i>Japanese Religions</i>, 30(1 & 2), 21–53.</p> <p>Nabesawa, Nepki. 1998. ‘Kariba o Tsukasadoru Kami to Okikurmi’ [The God Who Controls Hunting Lands and Okikurmi]. In <i>Kayano Shigeru no Shinwa Shūsei</i> Vol. 3 [A collection of Ainu myths by Shigeru Kayano], edited by Shigeru Kayano, 74–89: Tokyo: Heibonsha</p> <p>Yamada, H. (2013). The “Master of Animals” Concept of the Ainu. <i>Cosmos</i>, 29, 127–140.</p>
3.5.	Knowledge inspiration				
		<i>Electrophorus electricus</i> , known as the electric eel and L'elettroforo among other names	European scientific community of the 18th and 19th centuries	Widely investigated in European science, inspiring research that led to the invention of the electrochemical battery. Michael Faraday, Carl Sachs, Hugh Williamson and John Hunter were among the famous scientists who studied the species. Alessandro Volta was inspired to study the species, and in attempting to mimic the fish, he invented the electrochemical battery (which happened to be a totally different process to what the fish was actually doing) (Jorgensen, 2021).	Jorgensen, T. J. (2021). <i>Spark: The Life of Electricity and the Electricity of Life</i> . Princeton University Press.

#	Category	Species	People	Description	References
		<i>Xenopus laevis</i> (African Clawed Frog)	Developmental and synthetic biologist	<i>Xenopus laevis</i> is widely used as a model organism in developmental biology. Based on the vast knowledge pool for this species, synthetic living machines called Xenobots were created from the cells of this frog's embryo.	Blackiston, D., Lederer, E., Kriegman, S., Garnier, S., Bongard, J., & Levin, M. (2021). A cellular platform for the development of synthetic living machines. <i>Science Robotics</i> , 6(52), eabf1571.
4.	Worldviews, belief systems and cultural identities				
4.1	Worldviews and belief systems				
		Anuran species, likely <i>Amietia delalandii</i> (Isele lasemfuleni or Isele lomlambo in Nguni languages)	Nguni people of South Africa	Croaking of frogs following a cultural ritual on the banks of a river is a sign that ancestors have approved of said ritual. <i>Amietia delalandii</i> are the species usually heard croaking day and night on the banks of rivers	Hirst, M .M. (1991). <i>The healer's art: Cape Nguni diviners in the townships of Grahamstown</i> . (Doctoral dissertation: Rhodes University (South Africa)).
		<i>Crocodylus porosus</i> , known as Bāru	Gumatj clan of the Yolŋu people Arnhem Land in Australia	The Saltwater Crocodile are considered protectors of residents within the community.	Fijn, N. (2013). Living with crocodiles: engagement with a powerful reptilian being. <i>Animal Studies Journal</i> , 2(2), 1-27. https://ro.uow.edu.au/asj/vol2/iss2/2
		<i>Anguilla marmorata</i> known as <i>mauvo</i> or <i>puleo</i>	Guadalcanal Gule, including Uluna/sutahuri tribes in Malanga Region and people in the Malagheti region, Solomon Islands	The eel mauvo/puleo is special to certain tribes, such as Uluna/Sutahuri tribes and people in the Malagheti region; it is believed to keep the rivers and streams flowing and purify them. Eels are seen as guardians of river health, and groups enact stewardship practices such as refraining from harvesting them and strictly protecting them within their rivers and streams.	Unpublished data (Hevalao 2025)

#	Category	Species	People	Description	References
		<i>Silurus asotus</i> , known as namazu 鯰 also <i>Silurus biwaensis</i> known as biwako-onamazu 琵琶湖大鯰	Japanese people	The catfish namazu is strongly associated with earthquakes in Japan. The concept of a giant catfish under Japan, whose movements cause earthquakes, developed around Lake Biwa from origins in Chinese mythology and spread around Japan, being popular by the seventeenth century. In 1592 a directive in the building of a castle was to withstand “any type of great namazu event”. In versions of the myth, the catfish is held down by a stone held by the Kashima deity, in others by a bottle gourd. When the deity falls asleep, the catfish thrashes, and causes quakes. After the 1855 earthquake, namazu-e (pictures of the catfish) became very popular. The catfish (and associated quakes) were linked to the redistribution of wealth. Catfish have been believed to be able to predict earthquakes in Japan. The catfish is therefore a popular and widespread symbol of earthquakes, such as for signs indicating roads to not use after quakes, or as the logo or predictive agencies.	Smits, G. (2012). <i>Conduits of Power: What the Origins of Japan's Earthquake Catfish Reveal about Religious Geography. Japan Review, (24)</i> , 41-65. Doi:10.2307/41592687
		<i>Inia spp.</i> , boto	Residents of Brazilian Amazonia	There are multiple tales and beliefs about the boto, or the boto encantado (a supernatural version of the boto, to some people the two can be distinguished, to others they are the same). These can involve the boto as having malicious magic powers, boto sexual organs having particular powers, the act of having sex with a boto being magically good to the point of causing death, or in the most famous beliefs, the boto being able to shapeshift. Some example narratives involving the boto are in category 4.3.	Slater, C. (2012). <i>Dance of the dolphin: transformation and disenchantment in the Amazonian imagination</i> . University of Chicago Press.
		<i>Andrias spp.</i> known as Chinese Giant Salamander, 娃娃鱼(wáwáyú)	Communities in Anhui, Fujian, Chongqing, Gansu, Henan, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, Yunnan, and Zhejiang	One of the many common names of the Chinese giant salamander is 娃娃鱼(wáwáyú) which means ‘baby fish’, and is linked to a perceived association with dead babies. Associations with dead babies or children vary, for example in supposed similarly in crying sound, that babies, illegitimate babies or dead babies turn into salamanders, and that salamanders eat dead children. There are therefore local beliefs that the salamanders are bad luck and have a generally negative cultural value, and in some cases having taboos against eating them (sometimes because they are transformed dead babies).	Turvey, S. T., Chen, S., Tapley, B., Liang, Z., Wei, G., Yang, J., Wang, J., Wu, M., Redbond, J., Brown, T., & Cunningham, A. A. (2021). From dirty to delicacy? Changing exploitation in China threatens the world's largest amphibians. <i>People and Nature</i> , 3(2), 446–456. https://doi.org/10.1002/PAN3.10185/SUPPINFO

#	Category	Species	People	Description	References
		<i>Esox lucius</i> , known as Pike or Luce	English people, 17 th century, UK	It was believed that the pike could spontaneously generate from the Pickerel-weed, the weed to which it is very closely associated. Such a belief is no longer widely known or believed.	Walton, Izaak (1668). The Compleat Angler or the Contemplative Man's Recreation. Fourth Edition.
		<i>Maccullochella peelii</i> , known as pondi and Murray cod	Ngarrindjeri Nation, Australia	The pondi (Murray cod) is an important component of the Ngarrindjeri worldview, including the Ngarrindjeri philosophy of being (Ruwei Ruwar). Some aspects of this worldview are the roles of the pondi in the Creation (4.3), the pondi as a <i>Nagarti</i> (special animal), and as part of the relationship between people and Country (<i>Ruwe</i>), and multiple aspects of identity related to Country.	Ngarrindjeri Nation & Hemming, S. (2019) Ngarrindjeri Nation Yarluwar-Ruwe Plan: Caring for Ngarrindjeri Country and Culture Kungun Ngarrindjeri Yunnan (Listen to Ngarrindjeri People Talking). In: Natural History of the Coorong, Lower Lakes, and Murray Mouth Region (Yarluwar-Ruwe). <i>Royal Society of South Australia</i> . Eds: Mosley <i>et al</i> https://doi.org/10.20851/natural-history-cllmm
		<i>Acipenser fulvescens</i> , known as namä'o and Lake sturgeon	Menominee Nation, North America	The sturgeon, namä'o, is a sacred and important species to the Menominee people, with many important roles. For example, the sturgeon is the tribal historian, the ancient storyteller, or dreamkeeper of the Menominee people. The sturgeon “takes care of the rice beds from the water side, and we took care of it from the shore side” (Tom Tousey, tribal elder, 2017). David Nahwahquaw Grignon, Tribal Historic Preservation Officer of the Menominee tribe, says the loss of the sturgeon was a “very cultural and spiritual loss, loss of food sustenance, loss of cultural identity”	Beck, D. R. (1995). Return to Namä'o Uskiwämît: The Importance of Sturgeon in Menominee Indian History. <i>The Wisconsin Magazine of History</i> , 32-48. Tousey, Grignon, Reiter, Cox and Cox (2017) Nama'o The Ancient Story Teller [video]. Schwizer (director). POSOH Project. College of Menominee Nation, Sustainable Development Institute. University of Wisconsin-Madison. Available online at: https://www.youtube.com/watch?v=aR9E_nueoA
4.2	Spirituality and Religion				
		<i>Hucho taimen</i> , known as taimen	Mongolian people	Taimen are believed by groups in Mongolia to be children of the river god, linking humans and the spirit of the land and water	Sloat, M. R. (2023). What the Taimen Said: An Urgent Call for Conservation of the World's Largest Salmonids. <i>Fisheries</i> . 48,4. https://doi.org/10.1002/fsh.10887

#	Category	Species	People	Description	References
		<i>Anguilla bengalensis</i> , known as Rajabaam	Magar people, Nepali Hindus	Worshippers at the Chhabdi Barahi temple pray to both a stone figure of a Rajabaam, and to individual eels themselves who reside in the temple pool, who are sacred and conduits to the goddess of the temple, Barahi Devi. The first priest of the temple was instructed by Barahi Devi to worship her, and he then fell asleep. When he awoke, he found there was a new stone in the pool, which must be the goddess. An eel emerged and swam around the rock, a species he had never seen before, and he realised the eel and the goddess were connected. Today, the eels are a key aspect of the worship and practice at the temple, and are identified as guardians, messengers or incarnations of the goddess. Animals are sacrificed to the goddess as part of the puja (worship), and if the blood of the sacrifice is totally consumed by the eels and other fish, then the prayer will be granted by the goddess. Sacrifices are typically offered to the eel to ask for success in major life events (and latterly to give thanks), such as Gurkha recruitment or becoming pregnant. Other worshippers say that if you see the rajabaam, this means the goddess has seen you.	Unpublished interview and ethnographic data (Griffith & Basnet 2023 and 2025)
		<i>Maccullochella peelii</i> , known as otchocut	Boorong people, Australia	Otchocut is a constellation of the Boorong people, and is a constellation representing <i>Maccullochella peelii</i> . The selection of this species as constellation is likely a reflection of both the cultural importance of otchocut to the Boorong, with a key role in the Creation story of the Murray River, when Totyarguil chased the giant fish, which as it fled tore up a channel in the ground and created the Murray river. Totyarguil threw spears at the fish, but failed to catch it: today these spears and the spike on the back of the species. The constellation also rises and falls in the night sky over the time of the spawning season of the species.	Morieson, J. (1966) The Night Sky of the Boorong - Partial Reconstruction of a Disappeared Culture in North-West Victoria Available online at: http://www.aboriginalastronomy.com.au/wp-content/uploads/2018/05/Morieson_Thesis.pdf [Accessed: 26.09.2023]
		<i>Acipenser fulvescens</i> , known as namä'o and Lake sturgeon	Menominee Nation, North America	The sturgeon holds an important role in the Menominee religion, Metawin, offerings are made to the great fish for its return, and it holds an important spiritual position.	Beck, D. R. (1995). Return to Namä'o Uskiwämît: The Importance of Sturgeon in Menominee Indian History. <i>The Wisconsin Magazine of History</i> , 32-48.

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		<i>Tenualosa ilisha</i> , known as palla	Sindhi communities, especially Mallah people, Pakistan	Palla are believed to migrate (make a pilgrimage) around the shrine of Khwaja Khizr in Rohri, and are considered sacred. In some Mallah communities, Khwaja Khizar is worshipped for his role in helping the river flow. Khwaja Khizar is prayed to before going fishing, and the first catch is offered to him, with the palla especially favoured.	Jatt, Z. R. (2023). Lord of the River: An Outline of Khwaja Khizr's Worship in the Indo-Pak Subcontinent with a Focus on Sindh. In <i>Inter-religious Practices and Saint Veneration in the Muslim World</i> (pp. 241-260). Routledge.
4.3.	Narrative accounts				
		<i>Maccullochella peelii</i> , Pondi	Ngarrindjeri Nation, Australia	The pondee/pondi is important in the origin of the Murray River. In one telling of the Creation (<i>Kaldowinyeri</i>), from the Ngarrindjeri Nation Yarlurwar-Ruwe Plan: “A long, long time ago Ngurunderi our Spiritual Ancestor chased Pondi, the giant Murray Cod, from the junction where the Darling and Murrundi (River Murray) meet. Back then, the River Murray was just a small stream and Pondi had nowhere to go (Fig. 1.1.2). As Ngurunderi chased him in his bark canoe he went ploughing and crashing through the land and his huge body and tail created the mighty River Murray. When Ngurunderi and his brother-in-law Nepele caught Pondi at the place where the fresh and salt water meet they cut him up into many pieces, which became the fresh and salt water fish for the Ngarrindjeri people. To the last piece Ngurunderi said, ‘You keep being a Pondi (Murray Cod)’.”	Ngarrindjeri Nation & Hemming, S. (2019) Ngarrindjeri Nation Yarlurwar-Ruwe Plan: Caring for Ngarrindjeri Country and Culture Kungun Ngarrindjeri Yunnan (Listen to Ngarrindjeri People Talking). <i>Natural History of the Coorong, Lower Lakes, and Murray Mouth Region (Yarlurwar-Ruwe)</i> . Royal Society of South Australia. https://doi.org/10.20851/natural-history-cllmm
		<i>Inia spp.</i> , Boto	Residents of Brazilian Amazonia	There are multiple tales and beliefs about the boto, most commonly the story that the boto can turn into a handsome human form and seduce people, although beliefs vary hugely. In one commonly known version, the boto turns into a handsome man in white (or white man), wearing a hat (to hide his blowhole) who seduces young women at parties. A woman may be whisked off to the underwater city in the depths of the Amazon, or perhaps fall pregnant, and so illegitimate children may be known as ‘children of the boto’.	Slater, C. (2012). <i>Dance of the dolphin: transformation and disenchantment in the Amazonian imagination</i> . University of Chicago Press.

#	Category	Species	People	Description	References
		<i>Oncorhynchus</i> spp., known as <i>chep</i> , and Pacific salmon	Ainu People, Hokkaido, Japan	<p>Salmon captured by Ainu should be killed using “head knocking sticks” (isapa-kik-ni; lit. “wood to knock his head”) by Ainu to kill the caught salmon. This rule is important, as salmon prefer being killed with the ceremonial isapa-kik-ni (often made of willow), and can then allow the spirit from the salmon to return to the gods world: salmon will then return later to be caught and killed again. A narrative account of this information is conveyed in divine songs of the Ainu (oral tradition) which outline in the song the proper ways in which salmon should be killed, and the consequences of not obeying.</p> <p>Kosaka (2018) says: “An Ainu oral tradition tells of the God Who Controls Hunting Lands being informed that a human village was suffering from famine. When the god inquired the reason from another god whose spirit possesses the salmon, and from yet another god whose spirit possesses the deer, the God of Salmon answered that humans had forgotten to use a particular wooden stick when killing the salmon, which allows their souls to return to the gods’ world. Meanwhile, the God of Deer replied, ‘Humans have forgotten to worship the soul of deer, so I stopped supplying them to the human land’ (Nabesawa 1998: 83). Following the counsel of the God Who Controls Hunting Lands, humans resumed abiding by their traditional protocols for taking wildlife, and both gods came to forgive humans and supply salmon and deer again.”</p>	<p>Kosaka, Y. (2018). Revival of Salmon Resources and Restoration of a Traditional Ritual of the Ainu, the Indigenous People of Japan. In G. Roche, H. Maruyama, & A. V. Kroik (Eds.), <i>Indigenous Efflorescence: Beyond Revitalisation in Sapmi and Ainu Mosir</i> (p. 69). Australian National University Press.</p> <p>Wilhelm, J. H. (1999). Traditional Ecological Knowledge in the Beliefs of Japanese Fishing Villages: With Special Reference to Yoriiso (Miyagi) and the Sanriku Region. <i>Japanese Religions</i>, 30(1 & 2), 21–53.</p> <p>Nabesawa, Nepki. 1998. ‘Kariba o Tsukasadoru Kami to Okikurmi’ [The God Who Controls Hunting Lands and Okikurmi]. In <i>Kayano Shigeru no Shinwa Shūsei Vol. 3</i> [A collection of Ainu myths by Shigeru Kayano], edited by Shigeru Kayano, 74–89: Tokyo: Heibonsha</p> <p>Yamada, H. (2013). The “Master of Animals” Concept of the Ainu. <i>Cosmos</i>, 29, 127–140.</p>

#	Category	Species	People	Description	References
		<i>Acipenser fulvescens</i> , known as namä'o and Lake sturgeon	Menominee Nation, North America	<p>The sturgeon features with importance in the origin of the Menominee people, with variations in his role in different tellings, but essentially the sturgeon was given to the Menominee people in the creation.</p> <p>In a version reported in Beck (1995) the Sturgeon was the younger brother of the Bear, and has responsibilities including keeping the wild rice and serving as tribal historian. As historian, sturgeon knows things other totems do not, placing the sturgeon close to the Creator.</p> <p>In another version "when the Bear invited the Thunderer to become his brother, the Bear brought wild rice, and the Thunderer brought corn and fire to the new family. Other animals invited into the family by the Bear included the beaver (a woman) and Elk, to be directly related to the Thunderer, as well as the Sturgeon who was to be the younger brother and servant of the Bear." (as recorded by Walter J. Hoffman 1896 and reported in Beck 1995)</p> <p>In another version (Skinner 1913, reported in Beck 1995) "when the two Bears first became a man and a woman at the mouth of the Menominee River, the man immediately built a wigwam. His next act was to build a canoe "in order that he might go out on the waters and catch sturgeon, which were very abundant at the foot of a nearby cataract, where they had been created for the use of man"... his wife then prepared them "first she split them from the head down and drew them; then she hung them over a frame to dry. When they were sufficiently cured she cut them into flakes and made the first sacrifice and feast to all the powers."</p> <p>In another version (Bloomfield 1928, reported in Beck 1995) "When the first Menominee (the Bear clan) came into the world, they brought with them a kettle. They carried the kettle to the river, which they found to be "full of sturgeon". The tribe's leader used the kettle to cook sturgeon and feed his people" because of this ability to feed his people other clans joined the Bear.</p>	Beck, D. R. (1995). Return to Namä'o Uskiwämît: The Importance of Sturgeon in Menominee Indian History. <i>The Wisconsin Magazine of History</i> , 32-48.

#	Category	Species	People	Description	References
4.4.	Identity and relationships				
4.4.1.	Kinship	<i>Crocodylus niloticus</i> , known as Koena	Bakoena people of Lesotho	The Bakoena seboko (totem) is the koena (crocodile), including of the royal house of Lesotho.	Rosenberg, Scott; Weisfelder, Richard F. (13 June 2013). <i>Historical Dictionary of Lesotho</i> . p. 45. ISBN 9780810879829.
		<i>Crocodylus niloticus</i> , known as Koena	Bakoena clan of the BaSotho people of South Africa	Bakoena clan of South Africa's BaSotho people, many of which use the last name Mokoena have the Nile crocodile as their totem. Basotho of South Africa have shared ancestry with people of Lesotho.	Tšiu, W. M. (2006). Basotho clan praises (diboko) and oral tradition. <i>South African Journal of African Languages</i> , 2, 77–89 https://doi.org/10.1080/02572117.2006.10587271
		<i>Crocodylus niloticus</i> , known as Kwena	Bakwena clan of the BaPedi and BaTswana people of South Africa and the Batswana people of Botswana	Bakwena clan of South Africa's BaPedi and BaTswana people, many of whom use the last name Mokwena, have the Nile crocodile as their totem. BaTswana of South Africa have shared ancestry with people of Botswana.	Riep, D. M. M. 2011. <i>House of the Crocodile: south Sotho art and history in southern Africa</i> . PhD Thesis: University of Iowa.
		<i>Crocodylus niloticus</i> , known as Ngwenya or Ingwenya)	Ngwenya clan of the AmaNdebele, AmaXhosa, AmaZulu, Maswati, Vatsonga, people of South Africa	The Nile Crocodile is the totem of the Ngwenya (crocodile) clans of AmaNdebele (Phaka et al., 2023), AmaXhosa (Bongela, 2001), AmaZulu (Graham 2016), Maswati (Thwala, 2018), and Vatsonga (Phaka et al., 2023) respectively. Most of the members of these clans use the last name Ngwenya.	Bongela, KS 2001. Isihlonipho among amaXhosa. Phd dissertation: University of South Africa. Graham M. 2016. On identities, ways of knowing and interactions across difference in collaborative urban nature conservation at Macassar dunes, Cape Town. In: Ramutsindela M, Miescher G, Boehi M (eds) <i>The Politics of Nature and Science in Southern Africa</i> , pp.252-. Phaka, F. M., Hugé, J., Vanhove, M. P., & du Preez, L. H. (2023). Frog and reptile conservation through the lens of South Africa's nature-based cultural practices. <i>African Journal of Herpetology</i> , 72(2), 190-206.

#	Category	Species	People	Description	References
					https://hdl.handle.net/10520/ejc-ajherp_v72_n2_a190 Thwala, J. J. 2018. A Comparative Study of Clan Names and Clan Praises in Khumalo and Msogwaba Settlements. <i>Journal of Sociology and Social Anthropology</i> , 9(1), 1–9
		<i>Crocodylus porosus</i> , known as lafaek and saltwater crocodile	Timorese people, Timor-Leste	The saltwater crocodile, lafaek, is part of the Timorese belief system lulik in Timor-Leste, where there is kinship between certain cultural groups and the ancestor crocodile or Avo Lafaek, the grandfather crocodile.	Brackhane, S., Webb, G., Xavier, F. M. E., Trindade, J., Gusmao, M., & Pechacek, P. (2019). Crocodile management in Timor-Leste: Drawing upon traditional ecological knowledge and cultural beliefs. <i>Human Dimensions of Wildlife</i> , 24(4), 314–331. https://doi.org/10.1080/10871209.2019.1614240
		<i>Acipenser fulvescens</i> , known as namä'o and Lake sturgeon	Menominee Nation, North America	The sturgeon (namä'o) is totem for one of the Menominee tribe's clans (subgrouping under the bear clan)	Beck, D. R. (1995). Return to Namä'o Uskiwämīt: The Importance of Sturgeon in Menominee Indian History. <i>The Wisconsin Magazine of History</i> , 32-48.
		<i>Anguilla marmorata</i>	Delailasekau village of the Naitasiri highlands of Fiji	This species is an aquatic animal totem for Delailasekau village of the Naitasiri highlands of Fiji and therefore there is a taboo for killing and eating them across Fiji Islands.	Unpublished data (Rashni & Mailautoka)
4.4.2.	Supporting cultural identities	<i>Crocodylus niloticus</i> , known as Koena	BaSotho people of Lesotho	A koena can be seen today on the coat of arms of Lesotho signifying the cultural importance of <i>Crocodylus niloticus</i> which they have kept even though their modern day homeland/country has no crocodiles. Some of the country's sport teams are called dikwena (meaning crocodiles).	Rosenberg, Scott; Weisfelder, Richard F. (13 June 2013). Historical Dictionary of Lesotho . p. 45. ISBN 9780810879829.
		Anura (Unspecified frog species)	Multiple societies throughout the world	Frogs feature in the coat of arms of various places including The University of Notre Dame's Badin Hall (USA), Altenmoor (Germany), Obec Bohutín (Czechia), and Tsumeb (Namibia)	Wikimedia Commons contributors. (n.d.). <i>Category:Frogs in heraldry</i> . Wikimedia Commons. Retrieved May 1, 2025, from https://commons.wikimedia.org/wiki/C

#	Category	Species	People	Description	References
					ategory:Frogs_in_heraldry [Accessed: 09.04.2025]
		<i>Malaclemys terrapin</i> , known as Diamondback terrapin	People in the state of Maryland, USA	The Diamondback terrapin is Maryland's state reptile and also the mascot for the University of Maryland.	Maryland Sea Grant. (n.d.). <i>Diamondback Terrapins</i> . Available at https://www.mdsg.umd.edu/topics/terrapins/diamondback-terrapins#:~:text=The%20diamondback%20terrapin%20(Malaclemys%20terrapin,University%20of%20Maryland%2C%20College%20Park . [Accessed 10.04.2025]
		<i>Betta splendens</i> , known as Pla kat ปลากัด, Siamese fighting fish	Thai people	The pla kat has become a national icon in Thailand, including as the National Aquatic Animal, due to its important cultural role in fish fighting. Two male pla kat are placed together, and they will fight, the winning fish in the fight winning the match. The result can be bet upon. The species has been domesticated and captive bred to enhance its utility for this fighting sport, with the knowledge and skills on breeding and keeping the fish passed down generationally.	Portugal, S. J. (2023). Siamese fighting fish. <i>Current Biology</i> , 33(9), R341-R343. Thailand Foundation (2020) Siamese Fighting Fish. Available online at: Siamese Fighting Fish – Thailand Foundation
		<i>Acipenser fulvescens</i> , known as namä'o and Lake sturgeon	Menominee Nation, North America	The sturgeon, namä'o, is a sacred and important species to the Menominee people, with many important roles. Due to dam building, persecution and overexploitation by US settlers, the namä'o was not seen in the Menominee Reservation for over a century. David Nahwahquaw Grignon, Tribal Historic Preservation Officer of the Menominee tribe, says the loss of the sturgeon was a "very cultural and spiritual loss, loss of food sustenance, loss of cultural identity"	Beck, D. R. (1995). Return to Namä'o Uskiwämît: The Importance of Sturgeon in Menominee Indian History. <i>The Wisconsin Magazine of History</i> , 32-48. Tousey, Grignon, Reiter, Cox and Cox (2017) Nama'o The Ancient Story Teller [video]. Schwizer (director). POSOH Project. College of Menominee Nation, Sustainable Development Institute. University of Wisconsin-Madison. Available online at: https://www.youtube.com/watch?v= aR9E_nueoA

#	Category	Species	People	Description	References
		<i>Oncorhynchus</i> spp., known as <i>chep</i> , and Pacific salmon	Ainu People, Hokkaido, Japan	<p>The first salmon of the season (as salmon begin their upstream migration) is received and welcomed in a ceremony known as Asircepnomi or Kamuycepnomi. This ceremony, and more broadly the fishing of salmon and Ainu-salmon relationship, is tied to Ainu identity, culture and rights.</p> <p>Kosaka (2018) says: “In 1982, after a 100-year interval, the wood carver Shigeo Toyokawa, who was a descendant of one of the Sapporo Ainu villages that had disappeared in the 1880s, in conjunction with Shōji Yūki, an activist for the restitution of Ainu rights, restored the Ainu ritual, Asircepnomi, to receive the first salmon of the season on the riverbanks of the Toyohira River. Toyokawa negotiated with the Hokkaidō prefecture government and succeeded in 1986 in being allowed to catch salmon in the river for this traditional ritual. Following Sapporo, this ritual was restored in Chitose, Asahikawa and Shiraoi, amongst other places, under the name of either Asircepnomi or Kamuycepnomi. Though the right to catch salmon has been restricted to ritual events, I appreciate that the restoration of ritual is an advancement towards the restitution of the Indigenous people. I think the Ainu people can demand further Indigenous rights to catch salmon to maintain their lifestyle, in other words, demand for the right to exist, because their ancestors depended on salmon for their survival before the Japanese Government annexed Hokkaidō”</p>	<p>Kosaka, Y. (2018). Revival of Salmon Resources and Restoration of a Traditional Ritual of the Ainu, the Indigenous People of Japan. In G. Roche, H. Maruyama, & A. V. Kroik (Eds.), <i>Indigenous Efflorescence: Beyond Revitalisation in Sapmi and Ainu Mosir</i> (p. 69). Australian National University Press.</p> <p>Roche, G., Maruyama, H., & Kroik, A. V. (2018). <i>Indigenous Efflorescence: Beyond Revitalisation in Sapmi and Ainu Mosir</i>. In G. Roche, H. Maruyama, & A. V. Kroik (Eds.), <i>Indigenous Efflorescence: Beyond Revitalisation in Sapmi and Ainu Mosir</i>. Australian National University Press. https://doi.org/10.22459/ie.2018</p>
4.4.3	Sense of, or connection to, place	<i>Crocodylus niloticus</i> , known as Kwena	BaPedi people of South Africa	Nile Crocodile is used as the placename for Mokgalakwena municipality in South Africa’s Limpopo province. Mokgalakwena is a compound word making reference to the might of the crocodile.	Raper PE, Moller LA, du Plessis TL. 1987. Dictionary of Southern African place names. n.p.: Lowry Publishers
		<i>Crocodylus niloticus</i> , known as Ngwenya	MaSwati people of South Africa	In the North Eastern part of South Africa there is a mountain range named Ngwenya mountains	Raper PE, Moller LA, du Plessis TL. 1987. Dictionary of Southern African place names. n.p.: Lowry Publishers

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		<i>Crocodylus niloticus</i> , known as by different names that have the root sound “Ngwenya” or “Kwena”	Indigenous people of South Africa	In several South African Indigenous cultures Nile Crocodile is used as either a clan name (e.g. Bakwena), family name (e.g. ngwenya used as last name), or a given name (e.g. Koena used as a first name).	Koma, H. M. (2012). An analysis of given and inherited names among the Northern Sotho speaking people in Moletjie and Sekhukhune, Limpopo Province: an onomastic perspective. (Doctoral dissertation, University of Limpopo) Raper PE, Moller LA, du Plessis TL. 1987. Dictionary of Southern African place names. n.p.: Lowry Publishers
		<i>Crocodylus niloticus</i> , known as Nile Crocodile (English) or Nyl Krokodil (Afrikaans)	Afrikaans and English people of South Africa	South Africa has a river named Crocodile River or Krokodilrivier in Afrikaans due to its large population of Nile Crocodiles.	Raper PE, Moller LA, du Plessis TL. 1987. Dictionary of Southern African place names. n.p.: Lowry Publishers
		<i>Crocodylus porosus</i> , known as Bāru	Yolŋu people Arnhem Land in Australia	A band made up of Yolŋu people is called Garrangali (crocodile nest).	Fijn, N. (2013). Living with crocodiles: engagement with a powerful reptilian being. <i>Animal Studies Journal</i> , 2(2), 1-27. https://ro.uow.edu.au/asj/vol2/iss2/2
		<i>Gavia immer</i> , known by many names, including the loon	Settler societies of North America (non-indigenous)	The haunting call of the loon has come to represent wilderness to many, as described by author Henry Thoreau in 1854 “a long-drawn and unearthly howl, probably more like that of a wolf than any bird, rising and falling as if it were the cry of a lost soul, or a banshee* wailing over some dead man’s grave” ...“this was his looning, - perhaps the wildest sound that is ever heard here” (7.3.2.). This association with wilderness and wolves had negative connotations to many in the 19 th century, and led to extensive historical persecution of the species. Today, the association has led to popular use of the call in media (7.2.1., 7.2.4.). *a banshee is a female spirit in Irish folklore who keens (a traditional Celtic form of wailing a lament) to foretell a death in the family	Thoreau, H. D., & Jones, H. M. (1964). <i>Walden</i> (p. 218). Houghton Mifflin. Langston, N., & Brosemer, K. (2022). Loons and the Risk of Extinction in a Warming, Toxic World. <i>Environmental History</i> , 27(2), 340-346.

#	Category	Species	People	Description	References
4.5.	Symbolic or associative meaning				
4.5.1.	Symbolic meaning	<i>Crocodylus niloticus</i> , known as Kwena	BaPedi people of South Africa	Nile Crocodile are symbolic of rain in BaPedi culture.	Lekgothoane S.K. and van Warmelo, N.J. 1938. Praises of animals in Northern Sotho, Bantu Studies, 12:1, 189–213, DOI:10.1080/02561751.1938.9676077
		<i>Crocodylus niloticus</i> , known as Kwena	Bafokeng clan of the BaTswana people of South Africa	The Bafokeng clan consider the Nile Crocodile as a symbol of peace in addition to it being their totem and use the phrase “let the crocodile return to water” as a declaration of peace. Heroes of the Bafokeng clan are likened to the Nile Crocodile when praising their strength and bravery.	Kgoroadira KO. 1993. The Praise Poetry of Bafokeng of Phokeng. (Masters dissertation, Rand Afrikaans University)
		<i>Crocodylus niloticus</i> , known as Ngwenya	AmaNdebele people of South Africa	Heroes of South Africa’s AmaNdebele community are likened to the Nile Crocodile when praising their strength and bravery.	Groenewald HC, 1998. Ndebele verbal art with special reference to praise poetry. (Doctoral dissertation, Rand Afrikaans University)
		<i>Crocodylus niloticus</i> , known as Ngwenya	VaTsonga people of South Africa	VaTsonga people use Nile Crocodile as an idiomatic expression of generosity towards the destitute.	Mathumba, I. (1988). Some aspects of the Tsonga proverb (Masters dissertation, University of South Africa).
		<i>Crocodylus porosus</i> and <i>Crocodylus mindorensis</i> , known as Buwaya	Filipino people	The crocodile is strongly associated with corruption, greed and deceit in mainstream modern Filipino culture, such as in media satire.	Van Der Ploeg, J. A. N., van Weerd, M., & Persoon, G. A. (2011). A cultural history of crocodiles in the Philippines: towards a new peace pact?. <i>Environment and History</i> , 17(2), 229-264.
		<i>Esox lucius</i> , known as the Pike, and historically, as the Luce, Lucy or Ged	British people	The pike is widely used in heraldry in the UK, typically as 'canting arms' that are a pun on the bearer's name "Lucy" used for pike, as when heraldry was being developed this would have been a common pun e.g. in Shakespeare (Moule 1842) The pike likely also had a close association with the weapon pike, and with the fleurs-de-lis, also representing the weapon, as well as the French origins of the name Lucy. In Scotland, it was used for a pun on the name "Ged". The widespread use of the pike as pun in heraldry tells us something of its cultural standing, as noble families would only want their family to be represented by an animal that has positive associations, perhaps ferocity, battle success, power and beauty.	Woodward, John (1892). A treatise on heraldry, British and foreign. Edinburgh: W. & A.K. Johnston. p. 694. LCCN 02020303. Moule, T. (1842). Heraldry of fish: notices of the principal families bearing fish in their arms. London: J. van Voorst.

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		<i>Silurus asotus</i> , known as Namazu 鯰 also <i>Silurus biwaensis</i> known as Biwako-onamazu 琵琶湖大鯰	Japanese people	The catfish namazu is strongly associated with earthquakes in Japan. The concept of a giant catfish under Japan, whose movements cause earthquakes, developed around Lake Biwa from origins in Chinese mythological creatures, and subsequently spread around Japan, being popular by the seventeenth century. In 1592 a directive in the building of a castle was to withstand “any type of great namazu event”. In versions of the myth, the catfish is held down by a stone held by the Kashima deity, in others by a bottle gourd. When the deity falls asleep, the catfish thrashes, and causes quakes. After the 1855 earthquake, namazu-e (pictures of the catfish) became very popular. The catfish (and associated quakes) were linked to the redistribution of wealth. Catfish have been believed to be able to predict earthquakes in Japan. The catfish is therefore a popular and widespread symbol of earthquakes in Japan, such as for signs indicating roads to not use after quakes, or as the logo or predictive agencies.	Gregory Smits (2012). <i>Conduits of Power: What the Origins of Japan’s Earthquake Catfish Reveal about Religious Geography</i> . <i>Japan Review</i> , (24), 41-65. Doi:10.2307/41592687
		<i>Oncorhynchus</i> spp., known as <i>chep</i> , and Pacific salmon	Ainu People, Hokkaido, Japan	<p>The first salmon of the season (as salmon begin their upstream migration) is received and welcomed in a ceremony known as Asircepnomi or Kamuycepnomi. This ceremony, and more broadly the fishing of salmon and Ainu-salmon relationship, is tied to Ainu identity, culture and rights. As such, the salmon has symbolic meaning to Ainu in multiple ways, including as a symbol of revitalisation and restitution.</p> <p>Kosaka (2018) says: “In 1982, after a 100-year interval, the wood carver Shigeo Toyokawa, who was a descendant of one of the Sapporo Ainu villages that had disappeared in the 1880s, in conjunction with Shōji Yūki, an activist for the restitution of Ainu rights, restored the Ainu ritual, Asircepnomi, to receive the first salmon of the season on the riverbanks of the Toyohira River. Toyokawa negotiated with the Hokkaidō prefecture government and succeeded in 1986 in being allowed to catch salmon in the river for this traditional ritual. Following Sapporo, this ritual was</p>	<p>Kosaka, Y. (2018). Revival of Salmon Resources and Restoration of a Traditional Ritual of the Ainu, the Indigenous People of Japan. In G. Roche, H. Maruyama, & A. V. Kroik (Eds.), <i>Indigenous Efflorescence: Beyond Revitalisation in Sapmi and Ainu Mosir</i> (p. 69). Australian National University Press.</p> <p>Roche, G., Maruyama, H., & Kroik, A. V. (2018). <i>Indigenous Efflorescence: Beyond Revitalisation in Sapmi and Ainu Mosir</i>. In G. Roche, H. Maruyama, & A. V. Kroik (Eds.), <i>Indigenous Efflorescence: Beyond Revitalisation in Sapmi and Ainu Mosir</i>. Australian National University Press. https://doi.org/10.22459/ie.2018</p>

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				restored in Chitose, Asahikawa and Shiraoi, amongst other places, under the name of either Asircepnomi or Kamuycepnomi. Though the right to catch salmon has been restricted to ritual events, I appreciate that the restoration of ritual is an advancement towards the restitution of the Indigenous people. I think the Ainu people can demand further Indigenous rights to catch salmon to maintain their lifestyle, in other words, demand for the right to exist, because their ancestors depended on salmon for their survival before the Japanese Government annexed Hokkaidō	
4.5.2	Figurative language	<i>Crocodylus suchus</i> , <i>Mecistops spp.</i> , <i>Osteolaemus spp.</i> , known as Nooda and Bama	Fula people and Bambara people	A proverb that translates as "No matter how long a log stays in the water, it doesn't become a crocodile." is used in multiple west and central african languages, including Fula and Bambara "Ko leggal booyii ley ndiyam, laatataako noora." (Fula) "Jirikurun men o men ji la, a te ke bama ye." (Bambara)	[Reporting of Fulani Proverbs] https://africanmanners.wordpress.com/2012/07/07/fulani-proverbs-30-in-total/ [Reporting of African Proverbs] https://afriprov.tangaza.ac.ke/jun2001/
		Anura spp. (Unspecified frog species)	AmaZulu of South Africa	In Zulu culture frogs are used as an idiomatic expression for nudity.	Ritter ER. 1955. <i>Shaka Zulu</i> . Penguin Publishers, London.
		Anura (Unspecified frog species)	AmaXhosa of South Africa	The IsiXhosa idioms "ixoxo nexoxo liyazigxhumela" (translation: Each frog must jump for itself) encourages people to be independent.	Personal experience (Phaka)

#	Category	Species	People	Description	References
		<i>Crocodylus</i> spp. (Unspecified species, although most European contact at the time the phrase originated were likely <i>Crocodylus niloticus</i> and <i>suchus</i>)	Multiple, generally European-origin languages	<p>'Crocodile tears' is a widespread phrase in European-origin languages that means to display insincere emotion (generally false grief), coming from a belief that crocodiles shed tears while eating their prey (possibly a genuine phenomenon). The phrase 'crocodile tears' is widely used in popular culture and everyday conversation. The belief appears to have already been known by the time of Pliny the Elder, and has had variable support as to whether the phrase/belief comes from a genuine phenomenon, or a folkloric one. Shaner and Vliet (2007) show crocodiles sometimes shed tears during feeding, so it is possible the belief emerges from genuine observations.</p> <p>Examples of the phrase in popular culture and literature:</p> <p>From the Voyage and Travel of Sir John Mandeville (~1400) "in that contre... ben gret plentee of cokodrilles... theise serpentes slen men, and they eat them weeping" (as part of an accurate description of crocodiles, including their amphibious nature and lack of tongue)</p> <p>From the play Othello by Shakespeare "If that the earth could teem with woman's tears, each drop she falls would prove a crocodile."</p> <p>From the opera Dido and Aeneas by Henry Purcell "Thus on the fatal banks of Nile, / Weeps the deceitful crocodile."</p>	<p>D. Malcolm Shaner , Kent A. Vliet, Crocodile Tears: And thei eten hem wepyng, BioScience, Volume 57, Issue 7, July 2007, Pages 615–617, https://doi.org/10.1641/B570711 Crocodile tears Available at https://www.merriam-webster.com/dictionary/crocodile%20tears [Accessed 09.04.2025]</p>
4.5.3.	Associative naming	<i>Crocodylus</i> spp. known as Buaya, (primarily <i>Crocodylus porosus</i> the Saltwater crocodile)	Bahasa Indonesian and Malay speakers	Literally translating to 'land crocodile', the term 'Buaya darat' is used to describe a playboy (a man who likes to flirt with or engage in unserious relationships with women), referencing both the predacious nature of crocodiles and this type of man	Personal experience (Griffith)

#	Category	Species	People	Description	References
5.	Cultural and social practices				
5.1.	Social practices, rituals and festive events				
		<i>Oncorhynchus</i> spp., known as <i>chep</i> , and Pacific salmon	Ainu People, Hokkaido, Japan	<p>The first salmon of the season (as salmon begin their upstream migration) is received and welcomed in a ceremony known as Asircepnomi or Kamuycepnomi.</p> <p>Kosaka (2018) says: “In 1982, after a 100-year interval, the wood carver Shigeo Toyokawa, who was a descendant of one of the Sapporo Ainu villages that had disappeared in the 1880s, in conjunction with Shōji Yūki, an activist for the restitution of Ainu rights, restored the Ainu ritual, Asircepnomi, to receive the first salmon of the season on the riverbanks of the Toyohira River (Figure 5). Toyokawa negotiated with the Hokkaidō prefecture government and succeeded in 1986 in being allowed to catch salmon in the river for this traditional ritual. Following Sapporo, this ritual was restored in Chitose, Asahikawa and Shiraoi, amongst other places, under the name of either Asircepnomi or Kamuycepnomi. Though the right to catch salmon has been restricted to ritual events, I appreciate that the restoration of ritual is an advancement towards the restitution of the Indigenous people. I think the Ainu people can demand further Indigenous rights to catch salmon to maintain their lifestyle, in other words, demand for the right to exist, because their ancestors depended on salmon for their survival before the Japanese Government annexed Hokkaidō”</p>	Kosaka, Y. (2018). Revival of Salmon Resources and Restoration of a Traditional Ritual of the Ainu, the Indigenous People of Japan. In G. Roche, H. Maruyama, & A. V. Kroik (Eds.), <i>Indigenous Efflorescence: Beyond Revitalisation in Sapmi and Ainu Mosir</i> (p. 69). Australian National University Press.
		<i>Acipenser fulvescens</i> , known as namä'o and Lake sturgeon	Menominee Nation, North America	<p>The celebration for the first Sturgeon arrival at Namä'o Uskiwämît (a waterfall) is held by the Menominee people and involves traditional opening ceremonies, welcomings, speeches and performance of the Fish Dance. There is a feast including sturgeon and wild rice. This was a particularly important time for the Menominee historically, as the namä'o comes upstream to spawn in spring, providing vital food at the end of harsh winters. In 1993</p>	<p>Beck, D. R. (1995). Return to Namä'o Uskiwämît: The Importance of Sturgeon in Menominee Indian History. <i>The Wisconsin Magazine of History</i>, 32-48.</p> <p>Tousey, Grignon, Reiter, Cox and Cox (2017) Nama'o The Ancient Story Teller [video]. Schwizer (director). POSOH</p>

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				<p>this festival was held again after an absence of sturgeon in Menominee waters of over a century, at which event the family who had continued to offer prayers and ceremonies to the sturgeon during this absence was recognised.</p> <p>One menominee elder (reported in Beck 1995) said "When the sturgeon came up the Wol River to the falls some sturgeon were taken for a ceremonial feast... spiritually and culturally there is significance in all Menominee feasts. Like the sturgeon, Menominee live by cycles. The feasts, for example, occurred during the most opportune moment for the taking of the sturgeons based upon the sturgeon's cycle of reproduction. Offerings are always made in the way of prayer of thanks and tobacco out of respect for allowing the people to take the sturgeon. The prayers were to maintain balance, peace and harmony in their environment and nature."</p>	<p>Project. College of Menominee Nation, Sustainable Development Institute. University of Wisconsin-Madison. Available online at: https://www.youtube.com/watch?v=_aR9E_nueoA</p>
		<i>Anguilla anguilla</i> , known as Aal	People of Fockbeck, Germany	<p>In Fockbek, there is a three day <i>Aalversuperdaag</i> festival annually, which commemorates the the legend of the <i>Aalversupen</i> ("eel drowning"). In the tale, villagers who tried to breed herrings in Lake Fockbek by pouring salted herrings into the lake. When they later drained the lake, they found only a fat eel and assumed it had eaten the herrings. Seeking revenge, they decided to "drown" the eel by throwing it into the refilled lake. As it swam away, they exclaimed, "He versupt!" ("He's drowning!"). This humorous tale inspired the village's coat of arms, which is an eel pursuing a herring. There are still eel populations in the water bodies of Fockbek</p>	<p>Schröer, A. (2015) Fockbek: Wie der Aal auf das Dorfwappen kam shz.de Available online at: https://www.torial.com/anne.welkener/portfolio/66719 [Accessed: 10.11.2023]</p> <p>extra.shz.de (2022) Endlich wieder Aalversuperdaag! Ab heute feiert Fockbek zum 42. Mal sein traditionelles Dorffest Available online at: https://extra.shz.de/dorffest-fockbek-aalversuperdaag-17279/mittelholstein_nortorfer_land/endlich-wieder-aalversuperdaag-58885 [Accessed: 10.11.2023]</p>


#	Category	Species	People	Description	References
		<i>Cyprinus rubrofuscus</i> , known as Koi	Japanese people	As the carp is symbol of determination, vigour, and the overcoming of all obstacles to swim upstream, at the "Kodomo no hi" children's day festival, families fly koinobori (carp streamers) for each child in their house & pray for their children to grow up strong, happy and healthy. Originally this was boys day, and the wish was just for sons. The symbol of a carp as determined and dedicated to swim upstream is prevalent in the sinosphere, and comes from a traditional story of the carp that swim up to a waterfall, with the first to jump the waterfall becoming a dragon (ironically, since carp are non-migratory, and most likely a mistranslation of the earliest telling involving a 'yellow sturgeon' which are migratory, and do jump out the water, looking impressively like dragons.	New England Regional Art Museum () Koinobori Available online at: https://www.neram.com.au/koinobori/ [Accessed: 04.10.2023] Thier, M. (2008) Eins zurück, zwei vor – Feiertage in Japan Available online at: https://www.zjapanr.de/index.php/zjapanr/article/view/223 [Accessed: 04.10.2023]
		<i>Pyxicephalus adspersus</i> (Giant Bullfrog) and some unspecified Anuran species, freshwater mussels, terrapins and turtles, and multiple fish genera (<i>Clarias</i> , <i>Synodontis</i> , and <i>Cyprinidae</i> .)	Hunter-gathers society of the Shashe-Limpopo Confluence Area, South Africa	Archaeological evidence shows that some hunter-gather societies of South Africa used to sacrifice frogs, turtles, fish, and mussels among other animals for rain control rituals.	Brunton, S., Badenhorst, S., & Schoeman, M. H. (2013). Ritual fauna from Ratho Kroonkop: a second millennium AD rain control site in the Shashe-Limpopo Confluence area of South Africa. <i>Azania: Archaeological Research in Africa</i> , 48(1), 111-132.
		<i>Tenualosa ilisha</i> , known as palla	Sindhi communities, especially Mallah people, Pakistan	In some Mallah communities, Khwaja Khizar is worshipped for his role in helping the river flow, as the patron saint of waterways. Khwaja Khizar is prayed to before going fishing, and the first catch is offered to him, with the palla especially favoured. Furthermore, when Sindhi women pray at the shrine of Khizar, and palla should be offered in thanksgiving at the shrine if the prayer is answered.	Jatt, Z. R. (2023). Lord of the River: An Outline of Khwaja Khizr's Worship in the Indo-Pak Subcontinent with a Focus on Sindh. In <i>Inter-religious Practices and Saint Veneration in the Muslim World</i> (pp. 241-260). Routledge.

#	Category	Species	People	Description	References
5.2.	Social organisation				
		<i>Arapaima gigas</i> , known as Pirarucu	São Benedito community of the Ilha do Ituqui, Brazil	The "caçada" (hunting) of the fish held a particular mystique, and gives fishers prestige in their community. Arapaima fishing requires a lot of patience and a high degree of skill, because of the great size, strength and famous "inteligência" of the Arapaima. New and easier methods of Arapaima fishing are strongly condemned by most of the older fishermen and many of them think that the catching of an Arapaima in the traditional way earns the fisherman a high standing.	<p>Murrieta, R.S.S. (2001) 'A mística do Pirarucu: pesca, ethos e paisagem em comunidades rurais do baixo Amazonas', <i>Horizontes Antropológicos</i>, 7, pp. 113–130. Available at: https://doi.org/10.1590/S0104-71832001000200006.</p> <p>Murrieta, R. S. S., & Dufour, D. L. (2004). Fish and farinha: protein and energy consumption in Amazonian rural communities on Ituqui Island, Brazil. <i>Ecology of Food and Nutrition</i>, 43(3), 231-255.</p>
		<i>Sarotherodon galilaeus</i> , (Mango Tilapia) <i>Oreochromis niloticus</i> (Nile Tilapia), <i>Coptodon zillii</i> (Tedbelly Tilapia), <i>Clarias gariepinus</i> (Sharptooth catfish) and <i>Auchenoglanis occidentalis</i> (Giraffe Catfish)	Fisher communities around Lake Tono Reservoir, Ghana	Roles in Tono reservoir fisheries are gender biased, with more women than men taking part in fisheries, and roles dictated by gender. Typically men are fishers, conducting both fishing and mending of fishing gear, whilst women conduct fishmonger roles and manage overall enterprises such as selling, financing, and fisher employment.	<p>Abache, G., & Owusu-Frimpong, M. (2019). The Role of Gender in Artisanal Fisheries of the Tono Reservoir. <i>Ghana Journal of Science, Technology and Development</i>, 6(1), 15–20. https://doi.org/10.47881/124.967X</p> <p>Akongyuure, D. N., & Edziyie, R. (2020). Population characteristics of five major commercial fish species of the Tono Reservoir in northern Ghana. <i>Lakes and Reservoirs: Science, Policy and Management for Sustainable Use</i>, 25(2), 157–166. https://doi.org/10.1111/LRE.12315;WG ROUP:STRING:PUBLICATION</p>



#	Category	Species	People	Description	References
		<i>Lates niloticus</i> , Nile Perch	Lake Victoria fisher communities, Uganda and Kenya	Nile perch (<i>Lates niloticus</i>) has been introduced to Lake Victoria, with profound ecological and social impacts, including the collapse of native fish populations (including multiple extinctions) and changes in the social-economic fisheries and related livelihoods and lives. In fishing communities, fishers are typically men and fishmongers are women. The migrations of Nile perch lead to fishers following the species, and are more likely to engage in high-risk sexual activities when away from their spouses, and diminishing catches in the lake (especially of native species) have led fishmongers to sometimes form sexual relationships with fishers to secure fish, which together have led to substantial increases in HIV prevalence in fishing communities	Aloo, P. A., Njiru, J., Balirwa, J. S., & Nyamweya, C. S. (2017). Impacts of Nile Perch, <i>Lates niloticus</i> , introduction on the ecology, economy and conservation of Lake Victoria, East Africa. <i>Lakes and Reservoirs: Science, Policy and Management for Sustainable Use</i> , 22(4), 320–333. https://doi.org/10.1111/LRE.12192 ;PAGE:STRING:ARTICLE/CHAPTER
5.3.	Rules or customary norms				
		<i>Cygnus olor</i> , known as Mute swan	People of the United Kingdom of Great Britain and Northern Island	The monarch of the United Kingdom owns all unmarked mute swans in open water in the United Kingdom of Great Britain and Northern Island, under British law. This is well known in popular British culture. There are associated traditional practices, such as annual ‘swan upping’ when swans on the River Thames are caught and ringed.	Personal experience (Griffith) Exchequer of Pleas (1592) The Case of Swans 7 Co. Rep. 15b. 77 ER 435
		<i>Crocodylus niloticus</i> , known as Ngweṇa	Vhavenda people of South Africa	Killing Nile crocodiles, Ngweṇa, is tabooed as their brain is a key ingredient in making a potent poison, thus protecting these crocodiles will incidentally protect people's lives.	Mutshinyalo, T. T., & Siebert, S. J. (2010). Myth as a biodiversity conservation strategy for the Vhavenda, South Africa. <i>Indilinga African Journal of Indigenous Knowledge Systems</i> , 9(2), 151-171. https://hdl.handle.net/10520/EJC61597
		<i>Crocodylus niloticus</i>	Indigenous people of South Africa	It is against cultural norms for clan members to harm the totem of their clan.	Author's knowledge (FM Phaka)
		<i>Crocodylus porosus</i> , known as Bäru	Gumatj clan of the Yolṁu people Arnhem Land in Australia	The Saltwater Crocodile is a totem of the Gumatj clan. Yolṁu people have great respect for Saltwater Crocodile and only approve of harvesting and eating them when the community is facing starvation.	Fijn, N. (2013). Living with crocodiles: engagement with a powerful reptilian being. <i>Animal Studies Journal</i> , 2(2), 1-27. https://ro.uow.edu.au/asj/vol2/iss2/2


#	Category	Species	People	Description	References
		<i>Pseudoplatystoma fasciatum</i> , known as Surubim	Fisher families of the Tocantins River, Brazil	The most widely reported taboo species during a study in the 1980s, surubim consumption is taboo in certain circumstances, or 'reimoso' meaning it should be avoided especially in the case of illness, wounds, menstruation and post-childbirth. However, some may avoid eating a reimoso species altogether.	Begossi, A. and Braga, F.M.D.S. (1992). Food taboos and folk medicine among fishermen from the Tocantins River (Brazil). <i>Amazoniana</i> 12:101-118
		<i>Pusa sibirica</i> , known as nerpa, khabb and kuma	Lake Baikal communities, including Evenk, Buriat and Russian settlers	Hunters hold extensive knowledge on the correct way to behave in relation to nerpa and hunting of the species. For example, seals must be shared by hunters according to sharing ethic (khubaaltkha), and to take only as much as needed.	Nomokonova, T., Losey, R. J., Iakunaeva, V. N., Emel'ianova, I. A., Baginova, E. A., & Pastukhov, M. V. (2013). People and seals at Siberia's Lake Baikal. <i>Journal of Ethnobiology</i> , 33(2), 259-280.
		<i>Oncorhynchus</i> spp., known as <i>chep</i> , and Pacific salmon	Ainu People, Hokkaido, Japan	<p>Salmon captured by Ainu should be killed using “head knocking sticks” (isapa-kik-ni; lit. “wood to knock his head”). This rule is important, as salmon prefer being killed with the ceremonial isapa-kik-ni, and can then allow the spirit from the salmon to return to the gods world: salmon will then return later to be caught and killed again. A narrative account of this information is conveyed in divine songs of the Ainu which outline the proper ways in which salmon should be killed, and the consequences of not obeying.</p> <p>Kosaka (2018) says: “An Ainu oral tradition tells of the God Who Controls Hunting Lands being informed that a human village was suffering from famine. When the god inquired the reason from another god whose spirit possesses the salmon, and from yet another god whose spirit possesses the deer, the God of Salmon answered that humans had forgotten to use a particular wooden stick when killing the salmon, which allows their souls to return to the gods’ world. Meanwhile, the God of Deer replied, ‘Humans have forgotten to worship the soul of deer, so I stopped supplying them to the human land’ (Nabesawa 1998: 83). Following the counsel of the God Who Controls Hunting Lands, humans resumed abiding by their traditional protocols for taking wildlife, and both gods came to forgive humans and supply salmon and deer again.”</p>	<p>Kosaka, Y. (2018). Revival of Salmon Resources and Restoration of a Traditional Ritual of the Ainu, the Indigenous People of Japan. In G. Roche, H. Maruyama, & A. V. Kroik (Eds.), <i>Indigenous Efflorescence: Beyond Revitalisation in Sapmi and Ainu Mosir</i> (p. 69). Australian National University Press.</p> <p>Wilhelm, J. H. (1999). Traditional Ecological Knowledge in the Beliefs of Japanese Fishing Villages: With Special Reference to Yoriiso (Miyagi) and the Sanriku Region. <i>Japanese Religions</i>, 30(1 & 2), 21–53.</p> <p>Nabesawa, Nepki. 1998. ‘Kariba o Tsukasadoru Kami to Okikurmi’ [The God Who Controls Hunting Lands and Okikurmi]. In <i>Kayano Shigeru no Shinwa Shūsei</i> Vol. 3 [A collection of Ainu myths by Shigeru Kayano], edited by Shigeru Kayano, 74–89: Tokyo: Heibonsha</p> <p>Yamada, H. (2013). The “Master of Animals” Concept of the Ainu. <i>Cosmos</i>, 29, 127–140.</p>

#	Category	Species	People	Description	References
6.	Recreation and leisure				
6.1.	Recreational hunting and fishing				
		<i>Salmo salar</i> , known as Laks	Norwegian recreational fishers (and tourists)	Recreational fishing for laks (Atlantic salmon) in Norway has been a major fishery in Norwegian culture for two centuries. Today, up to 80,000 anglers per year fish for laks, and spend ~125 million Euros, indicating the scale of involvement in this fishery	Guay, J. D., Lennox, R. J., Thorstad, E. B., Vollset, K. W., Stensland, S., Erkinaro, J., & Nguyen, V. M. (2023). Recreational anglers in Norway report widespread dislike of invasive pink salmon. <i>People and Nature</i> .
		<i>Anguilla anguilla</i> , known as Aal	Recreational fishers of Machlenburg-Vorpommern, Germany	The aal (European eel) is recreationally fished in the German state of Macklenburg-Vorpommern, with culturally dominant catching methods involving using earthworms as bait on a rod setup, and the eels are then removed and eaten. Fishers are most often middle-aged men. The estimated recreational annual harvest in the state is 187 t/year, including by both specialised eel anglers and more broad anglers who catch eel among other fish	Dorow, M. (2015). The social dimension of recreational fisheries management: the eel (<i>Anguilla anguilla</i>) example. Doctoral thesis. <i>Humboldt-Universität zu Berlin</i> . Germany.
		<i>Esox lucius</i> , known as Hecht, Pike	Recreational fishers of Rügen, Germany	The hecht (pike) <i>Esox lucius</i> is a popular species in the recreational fishery of Rügen, Germany. There is a particular importance according to trophy pike: female individuals reaching over 100cm. Declines in numbers of large individuals in the population of the lagoons of Rügen has caused great concern, and led to substantial research and management work to try and understand this change.	Arlinghaus, R., Rittweg, T. ..., & Winkler, H. (2023). A synthesis of a coastal northern pike (<i>Esox lucius</i>) fishery and its social-ecological environment in the southern Baltic Sea: Implications for the management of mixed commercial-recreational fisheries. <i>Fisheries Research</i> , 263, 106663.
		<i>Acipenser fulvescens</i> , known as lake sturgeon	Recreational fishers of Lake Winnebago, USA	Spear-fishing of lake sturgeon for recreation has been popular in Lake Winnebago since the 1930s, and remains so today	Kline, Kathleen Schmitt, Ronald M. Bruch, and Frederick P. Binkowski. <i>People of the sturgeon: Wisconsin's love affair with an ancient fish</i> . Vol. 2. Wisconsin Historical Society, 2009.

#	Category	Species	People	Description	References
6.2.	Traditional sports and games				
6.2.1.	Live animal used in sports and games	<i>Betta splendens</i> , known as Pla kat ปลากัด, Siamese fighting fish	Thai people	The pla kat has become a national icon in Thailand, including as the National Aquatic Animal, due to its important cultural role in fish fighting. Two male pla kat are placed together, and they will fight, the winning fish in the fight winning the match. The result can be bet upon. The species has been domesticated and captive bred to enhance its utility for this fighting sport, with the knowledge and skills on breeding and keeping the fish passed down generationally.	Portugal, S. J. (2023). Siamese fighting fish. <i>Current Biology</i> , 33(9), R341-R343. Thailand Foundation (2020) Siamese Fighting Fish. Available online at: Siamese Fighting Fish – Thailand Foundation
6.2.2.	Representation of species in sports and games	<i>Crocodylus</i> spp.	English speaking people	In the game “Please Mr Crocodile” the crocodile is a character in this traditional children’s game. The origin of the game couldn’t be found, and it may occur in other languages. There are two lines drawn on the ground, these are the river. Children have to cross from one side of the river to the other, asking some variation of “Please Mr Crocodile can we cross the river?” ‘Mr Crocodile’ replies a variation on “Yes, if you are wearing [names a colour]” Children wearing that colour can cross without risk of being caught by Mr Crocodile, others have to run across and avoid being caught.	Personal experience (Griffith)
		<i>Esox lucius</i> , known as Hecht and pike	Communities in Rügen, Germany	In a local playground in Rügen, the seesaw (a classic children’s game item) is carved and painted to look like a hecht (pike). This is unusual in Germany, and reflects the local cultural significance of the hecht.	Personal experience (Griffith) 
6.3.	Aesthetics and wellbeing				
		Odonata spp., known as Dragonflies	Residents of London, UK	Dragonflies associated with pond habitats are appreciated as aesthetically appealing and interesting to most people, especially for their colour, high visibility, and ephemeral occurrence.	Ngiam, Robin Wen Jiang, Wei Ling Lim, and C. Matilda Collins. A balancing act in urban social-ecology: human appreciation, ponds and dragonflies. <i>Urban ecosystems</i> 20 (2017): 743-758.
		<i>Salmo salar</i> , known as Atlantic salmon, saumon, lachs, lax and laks	People of France, Germany, Sweden and Norway	Many people associate salmon with beauty, health, and cultural significance, suggesting that the presence of salmon in rivers enhances people's connection to nature and contributes to their well-being.	Kochalski, S., Riepe, C., & Arlinghaus, R. (2022). Perceived socio-cultural ecosystem services provided by wild Atlantic Salmon populations in four European countries. <i>Aquatic Ecosystem Health & Management</i> , 25(3), 12–21.

#	Category	Species	People	Description	References
6.4.	Tourism				
6.4.1.	Cultural tourism	<i>Alligator mississippiensis</i> , known as Alligator	Seminole tribe of Florida	The Seminole tribe of Florida have a long history with alligators, which was developed by Seminole people in the 20 th century into a cultural and tourism business of live gator-wrestling shows, in which Seminole alligator wrestlers display their skills. Alligator wrestling is till today an important cultural tradition and sport, that remains practiced today.	West, P. (1998). <i>The Enduring Seminoles: From alligator wrestling to ecotourism</i> . University Press of Florida.
6.4.2.	Nature-based tourism	Anura (multiple frog species)	Ecotourists in general	Frogs in biodiverse countries such as Perú are becoming popular attractions for ecotourists across the world.	Orlofske, S. A., Hedman, H. D., Koechlin, J. E., & Jadin, R. C. (2012). Herpetological ecotourism and conservation: reserva Amazónica, Perú. <i>Reptiles & Amphibians</i> , 19(4), 254-262.
		<i>Crocodylus porosus</i> , known as Saltwater crocodile	Residents of Northern Territories, Australia	The saltwater crocodile is a tourism icon in the Northern Territory, as evidenced by the use of images of the species in decoration, advertising and media throughout urban areas e.g. Darwin. Tourism ventures involving the species include tours to see and interact with the species in the wild, as well as in captive settings. The tourism value generates substantial economic activity for multiple groups including landowners and Traditional Owners.	Clancy, T. F. (2024). The next decade of management of the saltwater crocodile (<i>Crocodylus porosus</i>) in the Northern Territory: where to now for a conservation success story. In: <i>Proceedings of the 27th working meeting of the crocodile specialist group of the Species Survival Commission of the IUCN convened at Darwin Australia, 15-19 April 2024</i> . IUCN, Gland, Switzerland. Personal observations, 2024
		<i>Pteronura brasiliensis</i> , known by names including Lobos del rio, Chavaropan		Giant otter sighting tours are used as the focus and advertising for nature-based tourism in Peru	Recharte, M., Bride, I. G., & Bowler, M. (2015). A recovering flagship: giant otters, communities and tourism in northern Peru. <i>Wildlife Research</i> , 41(6), 490-498. Kirkby, C. A., Giudice, R., Day, B., Turner, K., Soares-Filho, B. S., Oliveira-Rodrigues, H., & Yu, D. W. (2011). Closing the ecotourism-conservation loop in the Peruvian Amazon. <i>Environmental Conservation</i> , 38(1), 6-17.
6.5.	Other recreation or leisure				

#	Category	Species	People	Description	References
7.	Creative Expression				
7.1.	Visual Arts				
7.1.1.	Representation in artworks	<i>Blommersia dupreezi</i> , (Local name unknown)	South African artist	Recently discovered Madagascan frog species on slate artwork by South African WBiemond.	
		<i>Breviceps passmorei</i> (Ndumo Rain Frog) and <i>Breviceps carruthersi</i> (Phinda Rain Frog)	South African artist	Two recently discovered South African rain frog species depicted on slate artwork by South African WBiemond.	
		<i>Crocodylus johnstoni</i> , (Ngäw) and <i>Crocodylus porosus</i> (Bäru)	Yolŋu people Arnhem Land in Australia	Yolŋu people represent their knowledge of the difference between Saltwater Crocodile and Australian Freshwater Crocodile in paintings; there is difference in stylistic representation of the paintings for the respective species along with a depiction of differences in head shape and snout.	Fijn, N. (2013). Living with crocodiles: engagement with a powerful reptilian being. <i>Animal Studies Journal</i> , 2(2), 1-27. https://ro.uow.edu.au/asj/vol2/iss2/2
		<i>Gavialis gangeticus</i>	Indian and Pakistani people, India and Pakistan	The gharial has appeared in artworks from the Indus and Ganges basins for over 5 millenia, being selected a typical and representative creature of the river, indicating its culturally salient, but commonplace, occurrence in the everyday life of the river. The frequent use of the gharial in river scenes indicates its role as a creature seen as beautiful, capable at catching fish, and sometimes ferocious.	Mustafa, B. (2023) The gharial saga: cultural importance and perception of an EDGE species in the Indus river system. Diploma thesis. University of Oxford.

#	Category	Species	People	Description	References
		<i>Hyperolius howelli</i> , known as Howell's Long Reed Frog	South African artist	East African Reed Frog species depicted on slate artwork by South African WBiemond.	
		<i>Esox lucius</i> , known as hauki or pike	Finnish people	The importance of the haiku to Finnish cuisine and fishing is reflected in the choice of Finnish artist to include the work 'the pike is a fish' by artist Outi Piironen in her series 'Ode to Finnish food fish'.	Piironen, O. (2022). The pike is a fish. Ode to Finnish food fish.
		<i>Esox lucius</i> , known as hauki or pike	Finnish people	Rock art images of pike are found at multiple sites in Finland, including Juusjärvi, Haukkavuori (Mäntyharju), and Kapasaari. Considered together, such images depict stages of a subaquatic shamanic journey, including a pike spirit helper being summoned by a shaman when entering a trance, a diving human figure descending into the spirit world, and a shaman surrounded by pike moving through the spirit (underwater) world.	Lahelma, A. (2008). A Touch of Red: Archaeological and Ethnographic Approaches to Interpreting Finnish Rock Paintings. <i>Iskos</i> , 15. https://journal.fi/iskos/article/view/7176
		<i>Maccullochella peelii</i> , known as Pondi	Ngarrindjeri Nation, Australia	The pondi (Murray Cod) is important in the origin of the Murray River, as told in the Ngarrindjeri Nation creation story (4.1, 4.3). Cultural weaver and artist, Ngarrindjeri Elder Ellen Trevorrow, created a sculpture of Pondi (her ngartji or totem) woven from river rushes, which is now displayed at the South Australian Maritime Museum, Adelaide.	South Australian Maritime Museum (n.d.) <i>Pondi: Kurri Winth-Amaldi (Murray Cod: River Creator)</i> South Australian Maritime Museum. Available at: https://maritime.history.sa.gov.au/events/pondi-murray-cod-kurri-river-winth-amaldi-creator/
7.1.2.	Representation in architecture	Anura (Unspecified frog species)	Ukrainian people	Italian-born sculptor Emilio Sala included frogs, among other animals, in the structural decorations of the House with Chimaeras (Budynok z khymeryami in Ukrainian); an Art Nouveau building situated in Kyiv, Ukraine.	Замки Києва Легенди і були Замка Ричарда, Дом с Химерами, замок барона Штейнгеля [Translation: Castles of Kiev: Legends were Richard's Castle, the House of Chimeras, Baron Steingel's castle] https://web.archive.org/web/20061104033503/http://www.interestny.kiev.ua/old/architecture/buildings/2 [Accessed: 08.04.2025]

#	Category	Species	People	Description	References
		<i>Cyprinus carpio</i> , carp, Karpfen	European people	The carp was used to symbolise the element of water in baroque architecture, and in was used in sculptures, particularly fountains. For example, the Staatliche Museen zu Berlin holds an item from Vienna, a limewood model of a boy holding a carp, as an allegory of water, that would have been then cast in metal.	Staatliche Museen zu Berlin () Putto mit einem Karpfen als Allegorie des Wasser Available online at: https://recherche.smb.museum/detail/863338/putto-mit-einem-karpfen-als-allegorie-des-wasser?language=de&question=karpfen&limit=15&sort=relevance&controls=attachments&objidx=6 [Accessed: 04.11.2023]
7.1.3.	Representation in crafts, artefacts and tools	<i>Crocodylus siamensis</i> , or <i>Crocodylus porosus</i> , known as Kyam or Mi-gyang	Mon people, Myanmar	The mi-gyang (Burmese) or kyam (Mon) is a crocodile shaped zither, with a name that just means 'crocodile'. This instrument is a type of zither, made of carved wood in the shape of a kyam/crocodile. There are wooden frets spaced diatonically. The three strings are plucked with a plectrum. It is associated with the Mon people.	[people playing the crocodile zither] https://www.youtube.com/watch?v=uE21-uW7xWE
		<i>Neolissochilus hexagonolepis</i> , known as Katlae	Newari people, Nepal	During a Newari wedding ceremony, it is traditional for the bride and groom to be offered fish, dressed in special wedding attire 'maatcha ko luga' ('fish clothes'). The fish clothes look like fish, likely representing Katlae as traditionally the fish to be eaten would be Katlae, but as the species has become more rare, the species that is eaten is often replaced with farmed fish such as carp. These fish clothes are a representation of the species, used in the ceremony in combination with the actual fish itself.	Unpublished interview data (Griffith 2023)
		<i>Salmo salar</i> , known as saumon, lachs and salmone	Community of Thurgau, Switzerland	Historisches Museum Thurgau holds a pastry model from the household of the Müller family in Frauenfeld. The model, which falls in this category, is in the shape of a wriggling salmon with finely modelled scales and tail fins. The resultant culinary item, which falls into category 7.1.5, would have been salmon shaped farmer's marzipan, which consisted of sugar, flour and eggs, came into fashion around 1600 and could replace expensive marzipan. The dough for aniseed rolls was made by adding ground aniseed seeds.	Historisches Museum Thurgau. (n.d.). <i>Gebäckmodel in Form eines sich windenden Fisches (Lachs) aus dem Haushalt der Familie Müller in Frauenfeld</i> . [Museum collection item] T 8943. Sammlung Historisches Museum Thurgau. Available online at: https://sammlung-hmtg.ch/exhibit/gebaeckmodel-in-form-eines-sich-windenden-fisches-lachs-aus-dem-haushalt-der-familie-mueller-in-frauenfeld-0000001204

#	Category	Species	People	Description	References
7.1.4.	Representation in costume, clothing and jewellery	<i>Salmo trutta, rhodanensis and marmoratus</i> , known as Lachs, Salmun, Saumon and Salmone	Swiss people	Medals created in Switzerland to mark the feast at the beginning of the new millennium and the introduction of the Gregorian calendar, around 1700, showed a gathering of 16 men around a table, in the centre of which a large trout lies on a platter. Trout holds cultural significance in Switzerland as the most popular and iconic fish. It symbolizes the nation's diverse landscapes, from mountain streams to midland lakes. The Swiss Fishing Federation honored trout as the Fish of the Year 2020, recognizing its importance in traditions and culinary practices	Medal held at the kenom - virtuelles Münzkabinett, owned by the Münzkabinett der Universität Göttingen https://www.kenom.de/objekt/record_DE-MUS-062622_kenom_389673/1/ Dominique «Domp» Lambert (2020) Schweizer «Fisch des Jahres» 2020: Die Forelle Available online at: https://fischernews.ch/2020/01/03/schweizer-fisch-des-jahres-2020-die-forelle/ [Accessed: 10.01.2024] also online Available online at: https://www.alpenfischer.com/ch-fisch-des-jahres-2020-die-forelle/ [Accessed: 10.01.2024]
		<i>Pristis pristis and pectinata</i> , known as Oki, and sawfish Among other names	Peoples of the Niger delta, including Ijo people, Nigeria	Helmet-masks, or headdresses, shaped like sawfish and carved with great skill from a single piece of wood, are worn for traditional ceremonies and rituals that honour water spirits. In such ceremonies, the person wearing the mask will dance and mimic the movements of sawfish to spectators and the water spirits who originally instructed the mask creation and dance performances.	Leeney, R.H. and McDavitt, M. (2019) Sawfishes in traditional tales. Save our Seas magazine. Available online at: https://saveourseasmagazine.com/sawfishes-in-traditional-tales/
		<i>Betta splendens</i> , known as Pla kat ปลาแคต, Siamese fighting fish	Thai people	The pla kat has become a national icon in Thailand, including as the National Aquatic Animal, due to its important cultural role in fish fighting. The species was the inspiration for the national costume of Miss Universe Thailand in 2020.	Portugal, S. J. (2023). Siamese fighting fish. <i>Current Biology</i> , 33(9), R341-R343. Thailand Foundation (2020) Siamese Fighting Fish. Available online at: Siamese Fighting Fish – Thailand Foundation
7.1.5.	Representation in culinary preparations	<i>Crocodylus porosus</i> , known as Buaya		‘Roti Buaya’ (‘bread crocodile’) is sweet bread shaped like a crocodile served at a Betawi wedding, given by the groom to the bride. The crocodile in Betawi belief is seen as faithful to a partner, protecting their children and their partners from harm, contrary to their fierce appearance. The gift of Roti Buaya therefore represents the sincerity of the groom to promise to be loyal to the bride, protect her, and also take care of their children, imitating the behaviour of a crocodile.	Siregar, I., & Rijal Yahaya, S. (2022). Semiotic Exploration of Roti Buaya as a Cultural Ornament. <i>British Journal of Applied Linguistics</i> 5, 2(1), 6–13. https://doi.org/10.32996/bjal

#	Category	Species	People	Description	References
		<i>Salmo salar</i> , known as saumon, lachs and salmone	Community of Thurgau, Switzerland	Historisches Museum Thurgau holds a pastry model from the household of the Müller family in Frauenfeld. The model, which falls in category 7.1.2, is in the shape of a wriggling salmon with finely modelled scales and tail fins. The resultant culinary item, which falls into this category, would have been salmon shaped farmer's marzipan, which consisted of sugar, flour and eggs, came into fashion around 1600 and could replace expensive marzipan. The dough for aniseed rolls was made by adding ground aniseed seeds.	Historisches Museum Thurgau. (n.d.). <i>Gebäckmodel in Form eines sich windenden Fisches (Lachs) aus dem Haushalt der Familie Müller in Frauenfeld</i> . [Museum collection item] T 8943. Sammlung Historisches Museum Thurgau. Available online at: https://sammlung-hmtg.ch/exhibit/gebaeckmodel-in-form-eines-sich-windenden-fisches-lachs-aus-dem-haushalt-der-familie-mueller-in-frauenfeld-0000001204
7.1.6	Other visual arts				
7.2.	Performing Arts				
7.2.1.	Music	<i>Crocodylus johnstoni</i> , (Ngäw) and <i>Crocodylus porosus</i> (Bäru)	Yolŋu people Arnhem Land in Australia	Yolŋu people represent their knowledge of the difference between Saltwater Crocodile and Australian Freshwater Crocodile through song. There is also a song about mangroves as the home of the Bäru.	Fijn, N. (2013). Living with crocodiles: engagement with a powerful reptilian being. <i>Animal Studies Journal</i> , 2(2), 1-27. https://ro.uow.edu.au/asj/vol2/iss2/2
		<i>Gavia immer</i> , known by many names, including the Loon and great Northern diver	Mainstream English-language culture e.g. USA, UK	The haunting call of the loon is popularly used in English-language pop music. For example, the call is featured in songs such as 'Thriller' by Michael Jackson, 'Pacific State' by 808 State, 'Babylon' by Lady Gaga, 'Attention' by Doja Cat, and 'Anaconda' by Nicki Minaj.	Burakoff (2024). How the common loon's eerie call took over pop music. <i>Audubon magazine</i> . Available online at: https://www.audubon.org/magazine/how-common-loons-eerie-call-took-over-pop-music Accessed 11.11.2024
		Anura (Unspecified frog species)	BaPedi people of South Africa	South Africa's BaPedi have nursery rhymes that sing about frogs and mimic their sounds	Interview data (Phaka 2022)
		Anura (Unspecified frog species)	VaTsonga and VhaVenda South Africa	South Africa's VaTsonga and VhaVenda people mention frogs in their folksong lyrics.	Johnston, T. F. (1973). Tsonga Children's Folksongs. <i>The Journal of American Folklore</i> , 86(341), 225-240. Nemukovhani, M.N. 1977. Tsingandedede. Mbeu Mission Bookshop: Sibasa.

#	Category	Species	People	Description	References
		<i>Oncorhynchus</i> spp., known as <i>chep</i> , and Pacific salmon	Ainu People, Hokkaido, Japan	<p>Salmon captured by Ainu should be killed using “head knocking sticks” (isapa-kik-ni; lit. “wood to knock his head”) by Ainu to kill the caught salmon. This rule is important, as salmon prefer being killed with the ceremonial isapa-kik-ni (often made of willow), and can then allow the spirit from the salmon to return to the gods world: salmon will then return later to be caught and killed again. A narrative account of this information is conveyed in divine songs of the Ainu (oral tradition) which outline in the song the proper ways in which salmon should be killed, and the consequences of not obeying.</p> <p>Kosaka (2018) says: “An Ainu oral tradition tells of the God Who Controls Hunting Lands being informed that a human village was suffering from famine. When the god inquired the reason from another god whose spirit possesses the salmon, and from yet another god whose spirit possesses the deer, the God of Salmon answered that humans had forgotten to use a particular wooden stick when killing the salmon, which allows their souls to return to the gods’ world. Meanwhile, the God of Deer replied, ‘Humans have forgotten to worship the soul of deer, so I stopped supplying them to the human land’ (Nabesawa 1998: 83). Following the counsel of the God Who Controls Hunting Lands, humans resumed abiding by their traditional protocols for taking wildlife, and both gods came to forgive humans and supply salmon and deer again.”</p>	<p>Kosaka, Y. (2018). Revival of Salmon Resources and Restoration of a Traditional Ritual of the Ainu, the Indigenous People of Japan. In G. Roche, H. Maruyama, & A. V. Kroik (Eds.), <i>Indigenous Efflorescence: Beyond Revitalisation in Sapmi and Ainu Mosir</i> (p. 69). Australian National University Press.</p> <p>Wilhelm, J. H. (1999). Traditional Ecological Knowledge in the Beliefs of Japanese Fishing Villages: With Special Reference to Yoriiso (Miyagi) and the Sanriku Region. <i>Japanese Religions</i>, 30(1 & 2), 21–53.</p> <p>Nabesawa, Nepki. 1998. ‘Kariba o Tsukasadoru Kami to Okikurmi’ [The God Who Controls Hunting Lands and Okikurmi]. In <i>Kayano Shigeru no Shinwa Shūsei</i> Vol. 3 [A collection of Ainu myths by Shigeru Kayano], edited by Shigeru Kayano, 74–89: Tokyo: Heibonsha</p> <p>Yamada, H. (2013). The “Master of Animals” Concept of the Ainu. <i>Cosmos</i>, 29, 127–140.</p>
7.2.2.	Dance	<i>Crocodylus johnstoni</i> , (Ngäw) and <i>Crocodylus porosus</i> (Bäru)	Yolŋu people Arnhem Land in Australia	Yolŋu people represent their knowledge of the difference between Saltwater Crocodile and Australian Freshwater Crocodile in dance; Saltwater Crocodile is represented with arms extended in front of the body and Australian Saltwater Crocodile represented by arms tucked in beside the body while dancing.	Fijn, N. (2013). Living with crocodiles: engagement with a powerful reptilian being. <i>Animal Studies Journal</i> , 2(2), 1-27. https://ro.uow.edu.au/asj/vol2/iss2/2

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7.2.3.	Theatre	<i>Crocodylus</i> spp., known as crocodile	British people, United Kingdom	In the traditional practice of pantomime in the UK (a comedic theatre performance, typically around Christmas time), a very popular story to perform is 'Peter Pan', based on the original 1904 play Peter Pan by JM Barrie. Central to the story is a crocodile who searches for the antagonist Captain Hook, as he once ate his hand (and a clock). However, Hook can hear the tiktok of the clock from the crocodile and always escapes. At the denouement of the play/pantomime, the tiktok crocodile gets to eat Hook. The representation of the crocodile on stage is a central and inventive part of the pantomime.	Barrie, J. M. (1904). <i>Peter Pan; or, The boy who wouldn't grow up</i> [Unpublished play script]. Premiered at the Duke of York's Theatre, London, December 27, 1904 Personal experience (Griffith)
7.2.4.	Cinema	<i>Crocodylus</i> spp. (Crocodiles) and <i>Alligator mississippiensis</i> , (Alligator)	Mainstream English-language culture e.g. USA, UK	Crocodiles and the American Alligator are the regular 'monster' of horror, thriller and adventure movies in popular film culture, those with a singular 'monster animal' focus are often known as "creature features". Films with crocodilian antagonists include Indiana Jones and the Temple of Doom (1984), USA - <i>Crocodylus palustris</i> is the species found in India, but Alligator mississippiensis is used for the footage; Jumanji (1995), USA - <i>Crocodylus niloticus</i> (presumably, as the majority of species originate from a mythical version of colonial 'Africa'); Live and Let Die (1973), USA - <i>Crocodylus acutus</i> and <i>Alligator mississippiensis</i> ; Crawl (2019), USA - <i>Alligator mississippiensis</i> ; Alligator (1980), USA - <i>Alligator mississippiensis</i> (brought from Florida to Chicago as a pet, released into sewers mimicking the 'sewer alligators' folklore; Lake Placid Series (1999-2018), USA - <i>Crocodylus porosus</i> (that has migrated to the USA 'across the Pacific')	
		<i>Gavia immer</i> , known by many names, including the Loon and great Northern diver	Mainstream English-language culture e.g. USA, UK	The haunting call of the loon is popularly used in English-language cinema to evoke wilderness, trepidation or a sense of the eerie. Often, this is disconnected from a genuine location where the loon call might be heard. For example, the call is used in the movies Harry Potter and the prisoner of Azkaban, Out of Africa, and Avengers: infinity war, and in TV shows such The Witcher, the Walking Dead, Game of Thrones, and Rome.	Cascione (2021) Why Hollywood loves this creepy bird call. Vox. Available online at: https://www.vox.com/videos/2021/10/13/22725104/hollywood-creepy-bird-call-common-loon Accessed 11.11.24

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		Turtles (Unspecified species)	Mainstream English-language culture	Four anthropomorphic turtles are protagonists in a movie franchise called 'Teenage Mutant Ninja Turtles'. The franchise also includes television series, video games and print media.	Teenage Mutant Ninja Turtles. Available at https://www.imdb.com/title/tt1291150/ . [Accessed 09.04.2025]
		Anura (Unspecified frog species)	Mainstream English-language culture	Amphibia is an animated television series which follows the adventures of a young girl who lives with a family of frogs.	Amphibia. Available at https://www.imdb.com/title/tt8050740/ [Accessed 09.04.2025]
7.2.5.	Other performing arts	<i>Betta splendens</i> , known as Pla kat ปลากัด, Siamese fighting fish	Thai people	The pla kat has become a national icon in Thailand, including as the National Aquatic Animal, due to its important cultural role in fish fighting. The species was the inspiration for the national costume of Miss Universe Thailand in 2020. The role of the species in a modelling competition falls in other performing arts.	Portugal, S. J. (2023). Siamese fighting fish. <i>Current Biology</i> , 33(9), R341-R343. Thailand Foundation (2020) Siamese Fighting Fish. Available online at: Siamese Fighting Fish – Thailand Foundation
7.3.	Language Arts				
7.3.1.	Literature	<i>Gavia immer</i> , known by many names, including the Loon	Mainstream culture of the USA	<p>The loon and its call are extensively discussed by the author Henry Thoreau in 1854, particularly regarding its call “a long-drawn and unearthly howl, probably more like that of a wolf than any bird, rising and falling as if it were the cry of a lost soul, or a banshee* wailing over some dead man’s grave” ...“this was his looning, - perhaps the wildest sound that is ever heard here”. The species is associated with a cultural sense of place in the USA (4.4.3.).</p> <p>*a banshee is a female spirit in Irish folklore who keens (a traditional Celtic form of wailing a lament) to foretell a death in the family</p>	<p>Thoreau, H. D., & Jones, H. M. (1964). <i>Walden</i> (p. 218). Houghton Mifflin.</p> <p>Langston, N., & Brosemer, K. (2022). Loons and the Risk of Extinction in a Warming, Toxic World. <i>Environmental History</i>, 27(2), 340-346.</p>
		<i>Esox lucius</i> , known as hauki or pike	Finnish people	The <i>Kalevala</i> is the Finnish national epic, compiled by Elias Lönnrot in the 19th century from traditional oral poetry, and it tells mythic and heroic tales central to Finnish folklore, identity, and cultural heritage. The pike features multiple times in the poetry, for example: Väinämöinen catches a giant pike and uses its jawbone to craft the first kantele, a magical stringed instrument. The music played on the kantele enchants all of nature and living beings. In another tale, the smith Ilmarinen seeks to marry the Maiden of	Lönnrot, E. (1849). The Kalevala (K. Bosley translation, 2008). OUP Oxford.

#	Category	Species	People	Description	References
				Pohjola. Her mother, Louhi, assigns him a series of formidable tasks, the final one being to catch a great pike from the River of Tuonela, the realm of the dead. Ilmarinen captures the pike, completing the tasks. In another tale, Lemminkäinen is killed and thrown into the Tuonela River, where his body is dismembered by the river's creatures, probably (based on the Tuonela pike of other stories) a giant pike. His mother gathers his scattered body and revives him.	
7.3.2	Poetry	<i>Crocodylus niloticus</i> , kwena	Bakoena clan of the BaTswana people, and AmaNdebele people of South Africa	The Nile Crocodile is used as a metaphor for the strength and bravery of clan's heroes in the poetry of the BaTswana and AmaNdebele people.	Groenewald HC, 1998. Ndebele verbal art with special reference to praise poetry. (Doctoral dissertation, Rand Afrikaans University) Kgoroadira KO. 1993. The Praise Poetry of Bafokeng of Phokeng. (Masters dissertation, Rand Afrikaans University)
		Anura (Unspecified frog species)	BaPedi people of South Africa	The praise-poetry of South Africa's BaPedi people uses frogs in their symbolism.	Interview data 2022
		<i>Esox lucius</i> , known as hauki or pike	Finnish people	The <i>Kalevala</i> is the Finnish national epic, compiled by Elias Lönnrot in the 19th century from traditional oral poetry, and it tells mythic and heroic tales central to Finnish folklore, identity, and cultural heritage. The pike features multiple times in the poetry, for example: Väinämöinen catches a giant pike and uses its jawbone to craft the first kantele, a magical stringed instrument. The music played on the kantele enchants all of nature and living beings. In another tale, the smith Ilmarinen seeks to marry the Maiden of Pohjola. Her mother assigns him a series of formidable tasks, the final one being to catch a great pike from the River of Tuonela, the realm of the dead. Ilmarinen captures the pike, completing the tasks. In another tale, Lemminkäinen is killed and thrown into the Tuonela River, where his body is dismembered by the river's creatures, probably (based on the Tuonela pike of other stories) a giant pike. His mother gathers his scattered body and revives him.	Lönnrot, E. (1849). The Kalevala (K. Bosley translation, 2008). OUP Oxford.

