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RESEARCH ARTICLE

How to Represent a Fish?

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Abstract

This article canvasses a broad range of fish representations across several disciplines. It asks what cultural studies can learn from scientific representations of fish, and considers in turn how cultural studies can produce nuanced understandings of the work of images. The objective of the article is to open debate about fish and their sustainability beyond discrete disciplines and/or ideologies. This, it is argued, is crucial if we are to go beyond a simplified cultural politics of fish.

Keywords

Fish images; more-than-human fish; sustainability; representation

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Ceci n'est pas un poisson¹

Once you begin to notice fish, you see them everywhere. Or at least that's my case. Several years of studying fish have turned me into a hyper-observant fish. I see fish everywhere. Of course they appear in places where I seek them out—fish markets, supermarket aisles, maritime museums, ports and docks—but I also see them in other places such as in fertiliser, food supplements for humans, pigs, chicken and fish, and even in supermarket omega-3 fortified white bread.

My argument is about how fish are represented. I will be asking: Who represents them with what effects? Are some representations more affective and effective than others in sustaining more-than-human fish worlds? How do scientists approach cultural representations of fish, and how do social scientists and humanities scholars understand scientific and technical representations of fish? Across multiple contexts, I follow the numerous ways fish are represented in the hope of rendering the simplified cultural politics of fish more complex—an argument to which I will return in due course. But for now please follow me into a web of fish images.

On a temperate winter's night, pitch dark at six pm, the Sydney Opera House breaks into full Aboriginal colours and cultures.² It's part of Vivid Sydney 2016, when the city lights up



Figure 1 Tip Top bread
Photograph: Elspeth Probyn

1 This is, of course, a [bad] play on Rene Magritte's *Ceci n'est pas un pipe*, which Michel Foucault describes as an intervention that 'disturbs all the traditional relations of language and image', Michel Foucault, 'Ceci n'est pas une pipe', trans. R. Howard, *October*, vol. 1, 1976, p. 10.

2 The artists were: Karla Dickens, Djon Mundine, Gabriella Possum Nungurrayi, Reko Rennie, Donny Woolagoodja and the late Gulumbu Yunupingu; see the Vivid Sydney website for more details, <<http://www.vividsydney.com/event/light/lighting-sails-songlines>>.

in spectacular ways. Nothing else I saw quite competed with *Songlines* for its technical and artistic virtuosity. Goannas, spearmen, dots that erupt from the red earth ... and fish that swim up the sails of the Opera House. It is a stunning representation of Aboriginal lives and livingness with this land. But 'land' as sea too. The fish climb out of the harbour waters and swim effortlessly over the sails and back to water. 'There is no sea-land dichotomy.'³ For fifteen minutes the light show emanates the simple truth: you are on the Aboriginal land and sea country of the Eora people.

There's a huge fish trap in the National Art Gallery in Canberra.⁴ Called the *Mandjabu*, or conical fish trap, it was based on a 1.2-metre-long fish trap probably designed by Anchor Kalunba from Maningrida in Arnhem Land. Kalunba was one of the last few people to construct these intricate affairs, which were used to trap barramundi and also sold as craft.⁵ These *Mandjabu* look like prototypes of *purse-seine* nets used around the world and (maybe wrongly) attributed to the Danish. *Purse-seines* are integral to many forms of fishing, and widely blamed for a large amount of by-catch. Contrary to this, Kalunba's trap would have been efficiently and ecologically used only for trapping barramundi in special fishing spots.

Below the hanging fish trap, a white man cradles a blobfish. This is Patricia Piccinini's *Eulogy*. Her artwork is fascinating: the wondrous sculptures of more-than-human forms fascinate; they attract and repel. She describes her work:

This sculpture is a celebration of the simple, gormless, wonderful existence of the blobfish. It is a eulogy for this particular specimen, supported in death by a very ordinary looking man. Perhaps he is one of the millions of ordinary people who neither know nor care much about the fate of the blobfish.⁶

The photograph I took of her sculpture captures the blobfish looking rather fed up. But perhaps that unsmiling mouth is a seductive *moue*. The blobfish to my mind is considerably sexier than the earnest young white man holding it hopelessly.

Piccinini's description marries the affective and the fight against facile emotion. Donna Haraway writes of her work: 'I recognized a sister in technoculture, a co-worker committed to taking "naturecultures" seriously without the soporific seductions of a return to Eden or the palpitating frisson of a jeremiad warning of the coming technological Apocalypse.'⁷ *Psychrolutes microporos* is a 'gormless' fish. It was for its unsightliness (to some humans) that it was named the world's ugliest animal in 2012. It was all for a good cause: the blobfish became the mascot for the Ugly Animal Preservation Society, in an initiative 'dedicated to raising the profile of some of Mother Nature's more aesthetically challenged children'.⁸ The organiser of the

3 Federal Court of Australia, National Native Title Tribunal finding, 10 August 2010, <<http://www.austlii.edu.au/au/cases/cth/FCA/2010/643.html>>.

4 The fish trap can be seen on the NGA website, <<http://nga.gov.au/exhibition/tactility/Detail.cfm?IRN=156786>>.

5 Jon Altman, 'Eastern Gunwinggu Fish Trapping at Gunbatgarri', *The Beagle: Occasional Paper of the Northern Territory Museum of Arts and Sciences*, vol. 1, no. 7, 1983.

6 Patricia Piccinini, 'Eulogy', 2011, <<http://www.patriciapiccinini.net/writing/35/298/70>>.

7 Donna Haraway, 'Speculative Fabulations for Technoculture's Generations: Taking Care of Unexpected Country', 2007, <<http://www.patriciapiccinini.net/writing/30/310/100>> .

8 See The Ugly Animal Preservation Society website, <<http://uglyanimalsoc.com/>>.

comedy event, Simon Watt, has published a book on ugly animals with the subtitle ‘we can’t all be pandas’. The book’s blurb states:

The plight of the panda is known the world over because of its teddy bear-like good looks, but most species are not so lucky. This book, however, aims to shine a light on some of the many ignored and unloved wonders of the animal kingdom. Their hideousness hides their incredible biology and means that we may not have noticed that they need our help.⁹

Watts is of course quite right, even if the discourse of humans helping nature is dubious on several levels. Animal conservation discourse and representations are rife with anthropomorphism—to the extent that World Wildlife Fund’s (WWF’s) campaign to save bluefin tuna has the fish decked out in panda masks: ‘Would you care more if I was a panda?’¹⁰ It simultaneously manages to insult human intelligence and make the noble bluefin look like a candidate for a *Kung Fu Panda* makeover.¹¹

Piccinini kicks back at the unappealing notion that we need cute animals to care. She also brings home to Australian and New Zealand audiences how close and yet how far is our connection with the blobfish. It lives at depths between six hundred and twelve hundred metres in the Southern Pacific and is endemic to Australia and New Zealand seas.¹² It is being killed off as by-catch in the hunt for its cousin, the slimefish, now renamed as orange roughy. If there ever were a poster-child for human stupidity, it’s the orange roughy. Once it was renamed it became all the rage, especially on American tables where eaters are well known for their dislike of ‘fishy fish’. Like other very deep-sea fish, it doesn’t particularly taste or smell like a fish. Some twenty-five years ago, in the so-called ‘Gold Rush’ roughy fisheries plundered its stock in the seas of the Southern Hemisphere.¹³ Unfortunately, at the time fishery managers and marine scientists knew very little about the fish—that, for example, the roughy is very long lived, and doesn’t come into sexual maturity until it is about twenty-five to thirty years old. The gentle roughy was easily scooped from their deep-sea canyons, and the population was soon nearly wiped out.

‘How to represent a fish?’ This sounds like a rather esoteric question—and indeed, as we will see, fish are represented in most of the world’s major religions. But I also want to explore how to represent fish from esoteric perspectives understood in common parlance ‘to be intended for or likely to be understood by only a small number of people with a specialized knowledge or interest’.¹⁴ Can we harness specialist representations of fish to advance a less simplified cultural understanding of fish, sustainability and human-marine connections? Writing about

9 Simon Watt, *The Ugly Animals: We can’t all be Pandas*, The History Press, Stroud, 2014.

10 This advertisement can be seen at the Ads of the World website, <https://adsoftheworld.com/media/print/wwf_panda_3>.

11 I don’t have the space to go into Pixar’s *Finding Nemo* sequel, *Finding Dory* (2016). I was disappointed that Dory is a *Paracanthurus hepatus*, a regal blue tang hunted for aquariums, not a member of the *Zeus faber*—the delicious John Dory.

12 Rainer Froese and Daniel Pauly (eds), ‘Psychrolutes marcidus’, FishBase website, 2010, <<http://www.fishbase.se/summary/Psychrolutes-marcidus.html>>.

13 See ‘Should we Eat the Orange Roughy’, Mar-Eco website, <http://www.mar-eco.no/learning-zone/backgrounders/deepsea_life_forms/orange_roughy_story.html>.

14 See the *Merriam-Webster Dictionary* online, <<http://www.merriam-webster.com/dictionary/esoteric>>.

representation in a cultural studies journal, one would expect a scholarly discussion of aesthetics to follow, or perhaps an argument about the impossibility of representation. Really, isn't talking about representation old hat unless it's a theoretical rant about non-representation?¹⁵

My interest in representing fish and representations of fish emerges from my research on sustainable more-than-human fish, which is to say the communities of fish and people that have clustered along coasts for millennia. My project differs from other studies of fish in that I am concerned about the sustainability of both fish populations and the humans who fish for a living, and who live with fish in complex ways. I do not, therefore, pursue an animal rights argument,¹⁶ nor do I conduct a strictly social science accounting of fish industries,¹⁷ or a geographical analysis of fish in situ.¹⁸ My project is an intervention into cultural studies, and an argument for widening our ideas of what counts within that discipline. For my book *Eating the Ocean*, I selected a paltry thirty-nine images of fish, and I had to put aside hundreds of photographs of fish and fish-related matter.¹⁹ Put aside, I hope, rather than discarded are images of fish nets, oyster dishes, oysters, oysters and more oysters, kitsch fish art, countless restaurant chalk boards in many countries that feature fish—always marked as 'sustainable' or 'wild'—fish statues, throngs of mermaids, sardine ghost towns in California and long deserted 'fishtowns' in Scotland, barmen with t-shirts that claim 'born to fish, forced to work', fish shapes made from driftwood, the colonial fish in the Porte Dorée Aquarium in Paris, the bored ones in the overhyped Monterey Bay Aquarium.²⁰

My collection could read a bit like a piscine version of Borges' 'Chinese encyclopaedia'.²¹ I suppose you could call it an archive although mostly it's a mess—in its often unarchived confusion—but I hope it might be a mess in the sense that Katrina Schlunke argues is productive of 'a network of events, objects and associations that challenge ordinary orders

15 In his review of Nigel Thrift's 2008 book on nonrepresentational theory, Phillip Vannini describes how nonrepresentational theory covers everything: 'Nonrepresentational theory is a mosaic of ideas borrowed from fields as different as performance studies, material culture studies, contemporary social and cultural theory, political economics, ecological anthropology, biological philosophy, cultural studies, the sociology of the body and emotions, and the sociology and anthropology of the senses.' Phillip Vannini, 'Nonrepresentational Theory and Symbolic Interactionism: Shared Perspectives and Missed Articulations', *Symbolic Interaction*, vol. 32, no. 3, 2009, p. 282. In its amnesia of particular feminist genealogies, it could also be said to remember little.

16 Dinesh Wadiwel, 'Do Fish Resist?', *Cultural Studies Review*, vol. 22, no. 1, 2016 pp. 196–244; Dinesh Wadiwel, Commentary on Key on Fish Pain 1, 'Fish and Pain: The Politics of Doubt', *Animal Sentience*, vol. 3, no. 31, 2016.

17 Kate Barclay, *A Japanese Joint Venture in the Pacific: Foreign Bodies in Tinned Tuna*, Routledge, London, 2008; Kate Barclay, 'The Social in Assessing for Sustainability: Fisheries in Australia', *Cosmopolitan Civil Societies: An Interdisciplinary Journal*, vol. 4, no. 3, 2012; Kevin St Martin, 'The Difference that Class Makes: Neoliberalization and Non-Capitalism in the Fishing Industry of New England', in *Privatization: Property and the Remaking of Nature-Society Relations*, ed. B. Mansfield, Blackwell, New York, 2008.

18 C. Bear and S. Eden, 'Thinking like a Fish? Engaging with Nonhuman Difference through Recreational Angling' *Environment and Planning D: Society and Space*, vol. 29, no. 2, 2011, pp. 336–52; C. Bear and S. Eden, 'Making Space for the Fish: The Regional, Network and Fluid Spaces of Fisheries Certification', *Social & Cultural Geography*, vol. 9, no. 5, 2008, pp. 487–504.

19 Elspeth Probyn, *Eating the Ocean*, Duke University Press, Durham, 2016. My thanks to my partner Sarah Donald who took many of the photos—the ones that ended up being useable unlike some of my hasty iPhone pics.

20 When I say colonial fish, I mean colonial fish. The Palais de la Porte Dorée's tropical aquarium opened in 1931 for the Paris Colonial Exposition, with a representation of fish from 'la Francophonie', the French empire.

21 Jorge Luis Borges, *Other Inquisitions 1937–1952*, University of Texas Press, Houston, 1993; Michel Foucault, *The Order of Things*, Pantheon, New York, 1970.

of representation'.²² It is well known that fish are set apart from humans on a number of levels. We don't live in their medium. We can't really see them unless we put on specialist apparatuses. They tend to be poikilothermic—cold-blooded—and thus feel a little slimy to our hot hands. And, yes, it is harder to cuddle a fish than a koala, although it should be noted that, like fish, koalas don't appreciate human hugs.

While I have taken a lot of fish images and photographed anything that might be fish-related, I hadn't actually thought about *how* fish are represented across disciplines. While this article could easily slide into a STS paper to understand the role of fish illustrations in science, that's not exactly my objective here. In any case, many in that field have admirably analysed scientific representations.²³ And despite a long-ago training in the history of art, my interest is not about the formal artistic qualities of representation. What follows here is an experiment: spurred by the 'discovery' of a genre called ichthyart—fish art—in a journal devoted to the biology of fishes, I want to consider scientific forms of representing fish. I hope to draw out an entanglement of representations that may serve as a partial guide to thinking both pragmatically and creatively about more-than-human fish. This is part of my ongoing quest to figure ways of conjoining different forms of knowledge in the hope of engendering public respect for fish, fishers, fishing communities, fishery managers and scientists.

Who is speaking for whom?

While much of my formal training in the canon of cultural studies has moved to the back of my mind, I still cannot think about 'representation' without Gayatri Spivak's framing coming to mind. Her well-cited replay of Marx's distinction between *Vertretung* and *Darstellung* as 'proxy and portrait' continues to be very useful.²⁴ As we will recall, *Vertretung* involves the practice of 'stepping in someone's place ... to tread in someone's shoes' or 'political representation', *Darstellung* is representation as re-presentation, 'placing there'.²⁵ The prefix '*Dar*' emphasises the 'thereness' of representation. This could be usefully conjoined with an emphasis on the 'thingness' of representations—the materiality and presence of representation. It is, however, particularly the political project suggested by *Vertretung*—'speaking in the name of'—that has troubled generations of cultural studies, feminist, Indigenous, queer and postcolonial scholars. As Spivak puts it, there is no easy way out of the conundrum posed by this: 'It is not a solution, the idea of the disenfranchised speaking for themselves, or the radical critics speaking for them; this question of representation, self-representation, representing others, is a problem.'²⁶

22 Katrina Schlunke, 'Hometown: Sustainable Queerness in the More-than-human Country Town', in *Cultural Sustainability in Rural Communities: Rethinking Australian Country Towns*, ed. C. Driscoll, K. Darian-Smith and D. Nichols, Routledge, London and New York, 2017.

23 In a special issue of *Human Studies* edited by Michael Lynch and Steve Woolgar many years ago: 'consider the varieties of representational devices used in science: graphs, diagrams, equations, models, photographs, laboratory conversations, and hybrid forms of these'; Michael Lynch and Steve Woolgar, 'Sociological Orientations to Representational Practice in Science', *Human Studies*, vol. 11, nos 2–3, 1988, p. 99. In true STS form, they proceed by not asking, 'what do we mean, in various contexts, by "representation" ... [rather we] begin by asking, "What do the participants, in this case, treat as representation?"'; Lynch and Woolgar, p. 109.

24 Gayatri Spivak, 'Can the Subaltern Speak?', in *Marxism and the Interpretation of Culture*, ed. C. Nelson and L. Grossberg, University of Illinois Press, Urbana, 1988, p. 108.

25 Ibid.

26 Ibid., p. 63.

Spivak's articulation of 'the problem' is a vexing one for those working in the various studies that fall within the loose assemblage of perspectives on the more-than-human.²⁷ While there is much exciting work being done under this rubric, as Karen Cardoza and Banu Subramaniam put it: 'the turn to including nonhuman animals in intellectual inquiries does not necessarily deconstruct a hierarchical Great Chain of Being'.²⁸ The representation—the *Darstellung* and the *Vertretung*—of certain human others in terms of certain non-human others is a longstanding historical basis of racist discourse. As Claire Kim puts it, 'animalization has been central not incidental to the project of racialization'.²⁹ But in some versions of the overlapping of critical whiteness studies and animal studies the question of representation, of who speaks for whom, continues to be the site of palpable tension. One can hear this in Fiona Probyn-Rapsey's project on 'dingology', where she feels the need to point out in order not to be misunderstood: 'I am not arguing that Aboriginal people and dingos are analogous'.³⁰ In the terms of Aileen Moreton-Robinson's ground-breaking book, *Aboriginal women can and do 'talk up to the white woman' in ways that dingos don't*.³¹

But back to representing fish. While it would/should be beyond the pale for white 'progressive' scholars to speak for the human Other, it is still not that unusual to find animal rights' advocates and others blithely speaking on behalf of fish. In the 1990 edition of his classic *Animal Rights*, Peter Singer recounts: 'With creatures like oysters, doubts about a capacity for pain are considerable; and in the first edition of this book I suggested that somewhere between shrimp and an oyster seems as good a place to draw the line as any'.³² Speaking for an organism as complex as an oyster seems to me to be foolhardy.

My three examples of fish representation above (the fish in *Songlines*, the *Mandjabu* and *Eulogy*) could have been plucked at random. But they weren't. As flagged above, I have been on the lookout for fish representations after I came across two articles about fish art and fish emotions in marine science journals: Moyle and Moyle's 'Introduction to Fish Imagery in Art' in the *Journal of Environmental Biology of Fishes*, and Reis and Hibbeln's 'Cultural Symbolism

27 As Marianne Dekoven argues in her article 'Why Animals Now?', 'feminist Postutopianism finds a home in animal or animality studies'; Marianne Dekoven, 'Why Animals Now?', *PMLA*, vol. 124, no. 2, 2009, p. 367.

28 Karen Cardoza and Banu Subramaniam, 'Assembling Asian/American Naturecultures: Orientalism and Invited Invasions', *Journal of Asian American Studies*, vol. 16, no. 1, 2013, p. 1.

29 Claire Kim, *Dangerous Crossings: Race, Species, and Nature in a Multicultural Age*, Cambridge University Press, Cambridge, 2015, p. 188, cited in Fiona Probyn-Rapsey, 'Dingos and Dog-whistling: A Cultural Politics of Race and Species in Australia', *Animal Studies Journal*, vol. 4, no. 2, 2015, p. 62.

30 Probyn-Rapsey, p. 62.

31 Aileen Moreton-Robinson, *Talkin' Up To the White Woman: Indigenous Women and Feminism*, University of Queensland Press, Brisbane, 2001.

32 Peter Singer, *Animal Liberation*, 2nd edn, Cape, London, 1990, pp. 174. The question of whether fish feel pain has recently been renewed through Dinesh Wadiwel's arguments about fish resistance in 'Fish and Pain', and his refutation of Brian Key's argument that fish don't feel pain. I take it that fish are sentient, which is now recognised in several international and national regulations; Vonne Lund et al., 'Expanding the Moral Circle: Farmed Fish as Objects of Moral Concern', *Diseases of Aquatic Organisms*, no. 75, 2007, p. 110; Marianne Lien and John Law, "'Emergent Aliens": On Salmon, Nature and their Enactment', *Ethnos*, vol. 76, no. 1, 2011, p. 65. Wadiwel takes issue with my research, arguing that I don't consider the violence of fishing. I do; however, my position differs from his and animal rights in general in that I am concerned with the politics of how to feed humanity as equitably and ethically as possible. The Food and Agriculture Organization (FAO) estimates that 'fish provided more than 3.1 billion people with almost 20 percent of their average per capita intake of animal protein'; FAO, *The State of World Fisheries and Aquaculture 2016. Contributing to Food Security and Nutrition for All*, FAO, Rome, 2016, p.4. Wadiwel's perspective does not take this into account. In general, anti-fishing activists don't explore other experiments such as the IMTA one I describe later, nor do they seem to know how much fish may go into fertiliser for their plant-based diets.

of Fish and the Psychotropic Properties of Omega-3 Fatty Acids' in *Prostaglandins, Leukotrienes & Essential Fatty Acids*.³³ In the former I learned about 'ichthyoart'.³⁴ In the latter I learned that the Christian use of fish as a symbol for Christ predates the crucifix, and that the Greek word for fish ΙΧΘΥΣ (Ichthus) is an acrostic for the Greek 'Jesus Christ the Son of God the Savior'.³⁵ I finally properly get the meaning of all those bumper stickers.

The lead author of the fish art article is Peter A. Moyle, who according to Google is a Distinguished Professor Emeritus in the Department of Wildlife, Fish and Conservation Biology and associate director of the Center for Watershed Sciences, UC Davis. Marilyn M. Moyle seems to be his wife—with no Google representation. They footnote the origin of the idea for their article; it came to them 'in the relaxed atmosphere of the Empress Hotel in Victoria, BC, one evening in 1986 as a follow-up to the EBF [*Environmental Biology of Fishes*] series on scientific illustrations'.³⁶

There is something delightful about the image of the husband and wife team relaxing in the Empress, a stately Canadian Pacific hotel renowned for its English high teas, contemplating the question of how fish have been represented in art for 'at least 14,000 years and in primitive art from many cultures'.³⁷

Their article documents the representation of fish in art across the millennia and cultures. The authors introduce how 'the basic simplicity of [the fish] shape works well in designs, making them easy to use as symbols for basic aspects of life: water, food, sex, and spirituality'.³⁸ They use the classifications from what was the gold standard in art history when I was a student, H. W. Janson's *The History of Art: The Western Tradition* (1962).³⁹ It was huge in several ways—I remember lugging the hefty tome around campus, and it sold more than two million copies in fifteen languages. It was an easy object of feminist criticism—across its nearly six hundred pages, not one woman artist was mentioned. The Moyles diligently proceed through Janson's categories: 1) primitive art, 2) ancient art, 3) medieval art, 4) Renaissance art, 5) neoclassical, romantic, realist, and impressionistic art, 6) modern art, 7) contemporary nature art, and finally 8) Asian art.⁴⁰ They include many wonderful examples of fish art, including Pieter Brueghel the Elder's 1557 *Big Fish Eat Little Ones* (a sort of fishy dog-eat-dog allegory of man's greed) and Paul Klee's 1926 *Around the Fish*, which is often seen as a commentary on scientific knowledge.⁴¹ The Moyles are certainly inclusive, although sometimes their logic is intriguing. For instance,

33 Peter B. Moyle and Marilyn A. Moyle, 'Introduction to Fish Imagery in Art', *Environmental Biology of Fishes*, no. 31, 1991; L.C. Reis and J.R. Hibbeln, 'Cultural Symbolism of Fish and the Psychotropic Properties of Mega-3 Fatty Acids', *Prostaglandins, Leukotrienes and Essential Fatty Acids*, no. 75, 2006.

34 Moyle and Moyle, p. 9.

35 Reis and Hibbeln, p. 231.

36 Moyle and Moyle, p. 22.

37 *Ibid.*, p. 5.

38 *Ibid.*

39 H. W. Janson, *Janson's History of Art: The Western Tradition*, Harry N. Abrams, Inc., New York, 1969.

40 Moyle and Moyle, p. 6.

41 Charles S. Kessler, 'Science and Mysticism in Paul Klee's *Around the Fish*', *The Journal of Aesthetics and Art Criticism*, vol. 16, no. 1, September 1957.

they take umbrage with the nomenclature of ‘primitive art’: ‘The word “primitive” is basically a misnomer in the same way it is when applied to the highly evolved sturgeons, sharks and lampreys.’⁴² It’s an interesting critique that both revises the taxonomy of fish as it replaces more-than-human ‘primitives’ in another taxonomic category of ‘highly evolved’ fish and humans.

I learn a lot from the Moyles. For instance, portrayals of tilapine cichlids were favoured in the tombs during Ramses II’s time. They note that this was probably because of ‘its importance as a food fish and because of its being a mouth brooder and therefore a symbol of rebirth and fertility’.⁴³ I have to admit that I had no idea what ‘mouth brooding’ was. A quick turn to the ubiquitous channel of representation, YouTube, revealed it to be a way cichlids protect their offspring. *Earth Touch* provides a video about the parenting habits of the cichlids of Lake Malawi and how when threatened the fry flock into the mother’s mouth—all twenty of them.⁴⁴ As a display of maternal love she doesn’t eat her offspring, although many other fish fathers and mothers routinely do.

In ‘Cultural Symbolism of Fish and the Psychotropic Properties of Omega-3 Fatty Acids’, L.C. Reis and J.R. Hibbeln conduct ‘a critical literature survey’ and ‘find that fish have been culturally labelled as symbols of emotional well-being and social healing in religious and medical practices among independent cultures, for at least six millennia’.⁴⁵ While I cannot find details about the first author, the second is Joseph R. Hibbeln, MD, acting chief of the National Institute on Alcohol Abuse and Alcoholism, which is part of the US National Institutes of Health. Hibbeln has been called ‘the Omega Man’ because of his passion for omega-3 fatty acids.⁴⁶ He is credited with originating the study of omega-3 fatty acids in depressive and aggressive disorders.⁴⁷ The results of his research have persuaded several institutions including the US military to consider prescribing omega-3 supplements to help deal with depression and associated disorders. Hibbeln is a captain in the United States Public Health Service, a uniformed service led by the Surgeon-General.

Reis and Hibbeln argue that the widespread representation of fish across cultures and eras is because of the association with the attributes of omega-3, which ‘drive the associative pairing of emotional states and visual stimuli’.⁴⁸ Their claim is that because of the psychotropic elements in fish (the effects of long-chain omega-3 fatty acids), people across time have experienced symbols of fish as calming, and peaceful. Representations of fish act like a Pavlovian stimulus: ‘Induction of an emotional state by the psychoactive properties of a substance can also drive the associative pairing of emotional states and visual stimuli.’⁴⁹

42 Moyle and Moyle, p. 6.

43 Ibid., p. 8.

44 Mouth-brooding Cichlids of Lake Malawi, Episode 6, <<https://www.youtube.com/watch?v=X9z5tXl0Sck>>.

45 Reis and Hibbeln, p. 227.

46 ‘The Omega Man’, *Bethesda Magazine*, November–December 2012, <<http://www.bethesdamagazine.com/Bethesda-Magazine/November-December-2012/Omega-3/>>.

47 Ibid.

48 Reis and Hibbeln, p. 228.

49 Ibid.

So the mere symbolic whiff of a fish could, they hypothesise, give the individual the feeling of well-being supposedly brought on by consuming omega-3. They then test this out by examining representations of fish in ancient Chinese and Greeks cultures, and in Christianity, Islam, Judaism, Hinduism, Buddhism, Shinto and Ancient Middle Eastern religions. Reis and Hibbeln find that ‘from symbolism in scriptural stories to incarnations of gods, fish is commonly portrayed as ... pure, frequently profoundly sacred ...’.⁵⁰ In their conclusion, they find ‘the ritual consumption of fish physiologically assists individuals in achieving internal states of harmony and well-being, as well as socially appropriate behaviours’.⁵¹ They hasten to add, ‘the gods represented by fish are peaceful gods ... We believe there is substantial evidence that the psychoactive properties of fish caused people around the world to independently identify fish as a food that calms aggression, reduces distressful emotions and promotes peacefulness in conscious and unconscious associations.’⁵²

An image from their article is a marvellous, synthesising representation of their complex argument. It includes the ways the ‘contemporaneous presentation of the visual image of fish and consumption of long-chain omega-3 fatty acids with psychotropic properties permits the associative pairing of image and emotion’.⁵³ They then trace the passage of this pairing through to the amygdala, which moderates the function of hippocampus and the visual cortex, and ‘facilitate[s] perceptual and memory functions in those regions’.⁵⁴ In the background we can see representation of the major religions and philosophies with the Christian fishes being most prominent.

Reis and Hibbeln’s article is cited in many well-being and self-help books. For instance, a clinical psychologist who believes that omega-3 can lead to ‘psi’ experiences uses it as support for her claims. She quotes nearly the entire article, and then describes how she self-experiments taking large doses of omega-3. ‘When I slowly updosed from 4,600 mg to 9,000 mg I had a stunning increase in psi—jaw-dropping synchronicities, precognitive dreams, and my first experiences of guidance in the form of short phrases said in a kind of neutral voice in my head (my own voice but not my own thought) and giving me ideas that were really unfamiliar to me.’⁵⁵

I’ve dwelled on these two articles because of how unusual they are. The omega-3 article is particularly intriguing in its argument—that all the major cosmologies and deities have evolved on the basis of the benefits of fish eating. The authors did, however, miss the anchovy. Apparently the Inca civilisation was based on the small fish.⁵⁶ More importantly, perhaps, they don’t mention that not all fish are created equal in the omega-3 stakes. Oily marine fish such as Peru’s anchovies are one of the top sources of omega-3, and they have

50 Ibid., p. 234.

51 Ibid., p. 224.

52 Ibid., p. 234.

53 Ibid., p. 233.

54 Ibid.

55 Sheila Joshi, ‘Omega-3: Part II: Psi-facilitative Effects’, *Neuroscience and Psi*, 28 July 2013, <<http://neuroscienceandpsi.blogspot.com.au/2013/07/omega-3-part-ii-psi-facilitative-effects.html>>.

56 Daniel Pauly and I. Tsukayama, ‘The Peruvian Anchoveta and its Upwelling Ecosystem: Three Decades of Change’, *ICLARM Studies and Reviews*, no. 15, 1987.

long been known as ‘la rica anchoveta’. They are rich in omega-3 and they also provided for Peru’s material wealth at different historical moments.⁵⁷ Mackerel has a content of 2.6 per 3.5 ounces while sole only has 0.1.⁵⁸ This is to say that the psychotropic qualities of sole are poor, even if it is now an expensive fish. In fact, the fish that are the highest in omega-3 have historically been the ones that the poor eat—which like herring and sardines are all ‘fishy fish’.

It is unusual for ‘hard’ scientists to venture into the ‘soft’ realms of art and culture, at least in print form. It is, however, well acknowledged that understanding fish requires a cultural dimension. But does it matter that the Moyle and Moyle article is hardly at the cutting edge of contemporary art theory? Would the fish-emotion paper have been stronger had the authors integrated the insights of the so-called ‘affective turn’ within cultural studies?

Of course ‘the affective turn’ was in large part the result of cultural studies taking on board certain representations from neuroscience and clinical psychology, notably to distinguish social ‘emotion’ from biological ‘affect’.⁵⁹ Jane Bennett’s theory of vibrant materiality is a notable example of such interdisciplinary borrowings.⁶⁰ Thinking with omega-3 deeply informs her argument. Bennett takes the various claims about what omega-3 can do as a springboard into her theorising about how food stuffs are actants.⁶¹ She ‘finds support in scientific studies of the effects of dietary fat on human moods and cognitive dispositions’.⁶² Bennett says these studies demonstrate that the marine omega-3 fatty acids Eicosapentaenoic acid (EPA) and Docosahexaenoic acid (DHA) ‘can make prisoners less prone to violent acts, inattentive children better able to focus, and bipolar persons less depressed’.⁶³ This leads her to argue: ‘to take seriously the efficacy of nonhuman fat is, then, not only to shift one’s idea about what counts as an actor but also to focus one’s attention away from individuals and onto actants in assemblages’.⁶⁴

But does Bennett get her fish facts wrong? From the perspective of science technology studies, Annemarie Mol’s ‘Eating Bodies in Practice and Theory’ team take issue not so much with Bennett’s understanding of fish but with the ways she uses the scientific studies she relies upon. The *claim* that omega-3 ‘can make prisoners less prone to violent acts, inattentive

57 See Probyn, *Eating the Ocean*, chapter 5, for a full discussion of anchovies and other ‘industrial fish’.

58 Reader’s Digest Editors, ‘Omega-3 Rich Fish’, *Reader’s Digest* online, <<http://www.rd.com/health/healthy-eating/omega-3-rich-fish/>>.

59 The list of those who have engaged in this ‘turn’ is too voluminous to reference. See Elspeth Probyn, *Blush: Faces of Shame*. Minneapolis, Minnesota University Press, 2000, for a fairly early entry in the arguments about what constitutes emotion versus affect, as well for an examination of what certain affects can productively do.

60 Jane Bennett, *Vibrant Matter: A Political Ecology of Things*, Duke University Press, Durham, North Carolina, 2010.

61 *Ibid.*, p. 39.

62 *Ibid.*, pp. 39–40.

63 *Ibid.*, p. 41.

64 *Ibid.*, p. 42.

children better able to focus, and bipolar persons less depressed' becomes a *fact* in Bennett's argument. Abrahamsson et al. argue that Bennett:

Cites the article to make a claim about omega-3—in isolation. The results of scientific research cannot be so easily disentangled from the methodological specificities of the original research and the relations in which these enmesh the substances explored.⁶⁵

In Bennett's rush to focus on the 'agency' of omega-3, she ignores that 'scientific research has little to say about matter itself. Instead, it explores matter engaged in relations and, crucially, helps to practically mediate such relations'.⁶⁶ In relation to omega-3 Abrahamsson et al. conclude that it 'is not matter itself all by itself, but rather matter in context. It is engaged in many relations ... The case of omega-3 helps to explore other modes of doing, such as affording, responding, caring, tinkering, and eating'.⁶⁷ In their lovely phrase, 'Matter may engage in relations of ever so many kinds'.⁶⁸ This recalls Schlunke's formulation of 'mess' as productive of 'a network of events, objects and associations that challenge ordinary orders of representation'.⁶⁹

Abrahamsson et al. construct a three-pronged argument, the first prong of which is 'what omega-3 may do'. The second is the question: 'Where does omega-3 comes from?'⁷⁰

If omega-3 is sourced from fish for human consumption, this may, in the short term, improve our moods, but in the slightly longer term it depletes the oceans. In the process not all human beings are affected equally ... omega-3 is not so much 'matter itself' as 'matter related'.⁷¹

In Abrahamsson et al.'s framing: 'as human eaters organize themselves in complex sociomaterial ways, the fish they eat has become entangled with long-distance routes'.⁷² These are simultaneously legal, technological, political and humanitarian issues that frame who has access to what and where. In their riposte to Bennett they write:

Rather than getting enthusiastic about the liveliness of 'matter itself', it might be more relevant to face the complexities, frictions, intractabilities, and conundrums of 'matter in relation'.⁷³

65 Sebastian Abrahamsson et al., 'Living with Omega-3: New Materialism and Enduring Concerns', *Environment and Planning D: Society and Space*, vol. 33, no. 1, 2015, p. 7.

66 *Ibid.*, p. 10.

67 *Ibid.*, p. 6.

68 *Ibid.*

69 Schlunke.

70 *Ibid.*, p. 11.

71 *Ibid.*, p. 12.

72 *Ibid.*, p. 9.

73 *Ibid.*, p. 10.

'Fish are our principle clients'

I'll return to questions of the different orders the representation of fish as fish-related matter might produce. But now I want to turn to mainstream or more conventional representations of fish in marine science, and fisheries management. There are, of course, important debates within and between the disciplines that compose marine sciences. For instance, the arguments of marine biologists, marine ecologists, marine zoologists, oceanographers, marine geologists and so on may differ from fisheries management scientists about how best to understand many important questions, such as how many fish are in the ocean. Here I will look at four important representations: Maximum Sustainable Yield (MSY), Individual Transferable Quotas (ITQs), trophic cascade (the simplification of the sea) and, finally, Integrated Marine Trophic Aquaculture (IMTA). The first two have been integral, for better or worse, in governing the fishing of the seas. Trophic cascade is what happens when the predators at the top of the food web are fished out, leading fisheries to target fish ever lower on the fish web, which then fundamentally puts the ecosystem out of kilter. What scientists call the simplification of the sea is when the ocean is stripped of biodiversity.⁷⁴ IMTA is a way of representing and implementing less deleterious ways of farming fish. These are then different orders of representation but they nonetheless involve the process of portraying fish (*Darstellung*), and representation as a medium whereby different forms of knowledge stand in for fish (*Vertretung*).

In my fieldwork I have been fortunate to meet and talk with very knowledgeable fish people, be they fishers, fishmongers, processors, scientists or fisheries managers. By and large they are patient with my ignorance, and sometimes there is a mutual excitement about fish matters. Several years ago Rob, who was very senior in state fisheries management, gave me an introduction to Maximum Sustainable Yield (MSY)—the historical cornerstone modelling for sustainable fishing. We were sitting in a pub in Adelaide as he gave a tutorial about fisheries regulation. He scrawled this image in my fieldwork notebook.

The model represents the equation of the biomass of any particular species, which is a calculation of how much is being fished against estimates of the reproduction of the species. The assumption here is that fish stocks renew themselves. While not on par with the infamous statements about the 'inexhaustible' nature of the fisheries, no natural resource is truly 'renewable' once it falls within the spheres of human activity.⁷⁵ Translated into Commonwealth, state, regional or international regulation, MSY is a tool for calculating what can be taken out of the sea in a 'balanced' manner. Rob described how fisheries management is essentially about controlling in-put and out-put, of 'controlling the number of dead fish'. In-put controls regulate the type of net, fishing gear, size of vessel and so on. Out-put controls are forms of regulation based on scientific calculations of fish extraction versus fish renewal. In Australia, the Australian Fisheries Management Authority (created by law under the Commonwealth Fisheries Administration Act 1991 and the Fisheries Management Act 1991 manages commercial fisheries from three nautical miles out to the extent of the Australian Fishing Zone, which

74 Leigh Howarth et al., 'The Unintended Consequences of Simplifying the Sea: Making the Case for Complexity', *Fish and Fisheries*, vol. 15, no. 4, December 2014.

75 This assessment is often attributed to T.H. Huxley in his Inaugural Address at the 1883 Fisheries Exhibition, London, <<http://aleph0.clarku.edu/huxley/SM5/fish.html>>. However Huxley's opinion was more nuanced: 'There are fisheries and fisheries'.

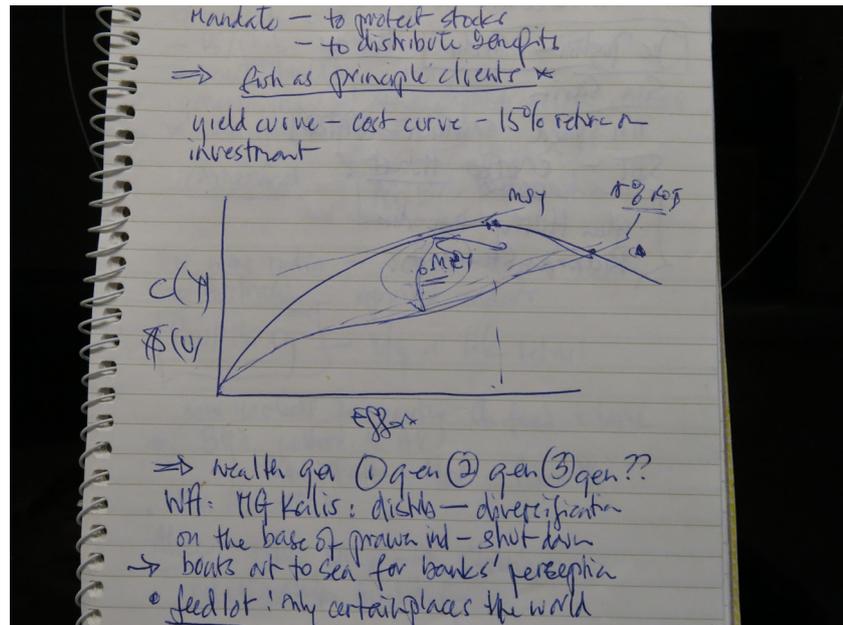


Figure 2 Author's field notebook

Photograph: Elspeth Probyn

is our Exclusive Economic Zone of two hundred nautical miles—comprising a massive ten million square kilometres.⁷⁶ The states and the Northern Territory regulate Australian recreational, commercial coastal and inshore fishing inside the three nautical mile zone, and aquaculture.

AFMA sets the size of the total allowable catch (TAC) for the major commercial fish species. In the early 1980s, quota systems were introduced in Iceland, Australia and Canada with other nations following suit. This was to rein in what is called 'the race to fish' or the 'Olympics of fishing'. When you only have a TAC, fishers rush to catch as many fish as fast as they can. The introduction of individual transferable quota (ITQ) was to check this tendency. 'Since quota share holders are guaranteed their particular share of the total catch, they have the freedom to pursue the timing and degree of effort and thus undesirable side effects such as the "race to fish" are eliminated.'⁷⁷

Gisli Pálsson and his colleagues have framed a sustained argument against ITQ.⁷⁸ They argue that, as a system, 'ITQs represent an extreme form of paternalism'.⁷⁹ The way the ITQ system usually works is that boat-owners are given a quota percentage based on the average catch over the past three years. When in 1990 the quota system in Iceland

76 See 'Fisheries Administration Act 1991', *Australian Government Federal Register of Legislation*, <<http://www.comlaw.gov.au/Series/C2004A04236>> and Fisheries Management Act 1991, *Australian Government Federal Register of Legislation*, <<http://www.comlaw.gov.au/Series/C2004A04237>>.

77 Edward J. Garrity, 'System Dynamics Modeling of Individual Transferable Quota Fisheries and Suggestions for Rebuilding Stocks', *Sustainability*, vol. 3, no. 1, 2011; doi:10.3390/su3010184

78 Gisli Pálsson and Agnar Helgason, 'Figuring Fish and Measuring Men: The Individual Transferable Quota System in the Icelandic Cod Fishery', *Ocean and Coastal Management*, vol. 28, nos 1-3, 1995.

79 Agnar Helgason and Gisli Pálsson, 'Contested Commodities: The Moral Landscape of Modernist Regimes', *Journal of the Royal Anthropological Institute*, vol. 3, 1997, p. 452.

and elsewhere was made ‘independently transferable’, it became possible to lease or rent quota.⁸⁰ This has had two consequences. Fishing rights became concentrated in a small number of large companies and, politically and pragmatically, the fishing commons was enclosed, and effectively privatised. Remember that the system represents fish and allocates the right to fish on the basis of previous catches. In this way, fishing rights in a commonly held ocean—according to Helgason and Palsson, the birth right of all Icelanders—is ‘transformed into privately owned, divisible commodities’.⁸¹

The ITQ system is a representation based on a previous representation—the infamous framing of ‘The Tragedy of the Commons’. Garrett Hardin published his essay in *Science* in 1968. It was at heart an argument against population growth, in which he used the example of how human nature will lead to the overuse and ultimate destruction of resources held in common. Hardin was a genetic biologist who quoted Alfred Whitehead: ‘The essence of dramatic tragedy is not unhappiness. It resides in the solemnity of the remorseless working of things.’⁸² For Hardin, faced with the freedom to reproduce, the only way of managing was through ‘mutual coercion’ and privatisation of the commons. The ITQ replays this quandary. On the one hand, fishing managers say that it is one of the best ways of reining in ‘the race to catch fish’, and ensuring that it won’t be the last fish. On the other, it is a privatisation of the oceans into neat units. In addition, it relies on the less than precise ability to know how many fish, and of what species, are in the sea. As Rob, my tutor in fisheries management policy, says, ‘fish have tails, and they don’t recognise jurisdictional lines’. Maribus, a German consortium of scientists, depicts how the FAO comes to formulate these figures:

The catch data from both the fishermen and the scientists is initially forwarded to higher scientific institutions which utilize it to estimate the current stocks of the various fish species and maritime regions. Around 1500 fish stocks around the world are commercially fished, with the various stocks being exploited to different extents. Comprehensive estimations of abundance currently exist for only around 500 of these stocks.⁸³

A simplified sea

As I flagged earlier, in marine science a ‘simplified sea’ refers to what happens when we fish down the food web, resulting in barren and hypoxic oceans—there are already many oceanic ‘dead zones’. Howarth et al. argue that through overfishing and management structures, ‘we are effectively manipulating nature in order to create simplified assemblages

80 Ibid., p. 453.

81 Ibid., p. 452.

82 Garrett Hardin, ‘The Tragedy of the Commons’, *Science*, 13 December 1968: vol. 162, no. 3859, pp. 1243–8, <<http://science.sciencemag.org/content/162/3859/1243.full>>. DOI: [10.1126/science.162.3859.1243](https://doi.org/10.1126/science.162.3859.1243)

83 ‘Fisheries’, World Ocean Review, <<http://worldoceanreview.com/en/wor-2/fisheries/state-of-fisheries-worldwide/>>.

dominated by targeted populations, comparable to monocultures in agricultural systems'.⁸⁴ The representation below is derived from an article written by Daniel Pauly and his team titled 'Fishing Down Marine Food Webs'.⁸⁵ It has since been cited over 3,600 times and caused a flurry of papers arguing for and against. Pauly's team on the Pew-funded project, 'Sea Around Us', at the University of British Columbia (an obvious nod to Rachel Carson's 1951 book *The Sea Around Us*) has produced several hundreds of highly cited scientific articles. Many of them have been controversial while also providing stunning insights. One such publication was in *Nature* (2001) where Pauly and his colleague Reg Watson argued that China had intentionally inflated its catch statistics to bolster its economic targets. This meant that the global fish count had been skewed, and when this was accounted for the numbers revealed that the global fisheries were in severe decline. Since then FOA provides two accounts: one that includes China and the other that doesn't—the latter is taken as correct. This made Pauly into a controversial marine science superstar. Even one of Pauly's fiercest critics, the marine scientist Ray Hilborn, describes him as 'an immensely charismatic, articulate, big-picture guy in a science that tends to produce little-picture guys'.⁸⁶

Pauly's argument about trophic cascade is that as bigger predators high in the trophic chain are reduced through industrial fishing, fish further down the web are targeted. This will/would eventually lead to a collapse of the entire web. The evidence of very large-scale jellyfish blooms over recent years indicates that this may be already happening. As one science blogger writes: 'The result is a trophic cascade, a regime change, an ecosystem that is free of fish predators, dominated by jellyfish, and of very little value or interest to humans.'⁸⁷

Beyond jellyfish 'n chips

Is it possible that the trophic connections and fish-relatedness can be represented, understood, and managed differently?

Figure 3 represents the Integrated Multi-Trophic Aquaculture model (IMTA), which could revolutionise how we understand fish. It represents fish as always fish-related—within a complex milieu and ecosystem. Thierry Chopin is a Canadian marine scientist who has done much to champion the system. He explains the concept: 'multi-trophic refers to the incorporation of species from different trophic or nutritional levels in the same system'.⁸⁸ In more elaborated terms:

84 L. Howarth, C.M. Roberts, R.H. Thurstan and B.D. Stewart, 'The Unintended Consequences of Simplifying the Sea: Making the Case for Complexity', *Fish and Fisheries*, vol. 15, no. 4, December 2014, p. 690.

85 Daniel Pauly et al., 'Fishing Down Marine Food Webs', *Science*, vol. 279, 1998.

86 David Malakoff, 'Profile Daniel Pauly: Going to the Edge to Protect the Ocean', *Science*, vol. 296, 19 April 2002, p. 459, <www.sciencemag.org>.

87 'Still Eating Jellyfish', *Eating Jellyfish or Can We Protect and Recover Marine Ecosystems*, <<http://eatingjellyfish.com/?p=2057>>.

88 Kelly Barrington et al. 'Integrated Multi-trophic Aquaculture (IMTA) in Marine Temperate Waters', in *Integrated Mariculture: A Global Review*, ed. D. Soto, FAO Fisheries and Aquaculture Technical Paper, no. 529, FAO, Rome, 2009, pp. 7–46.

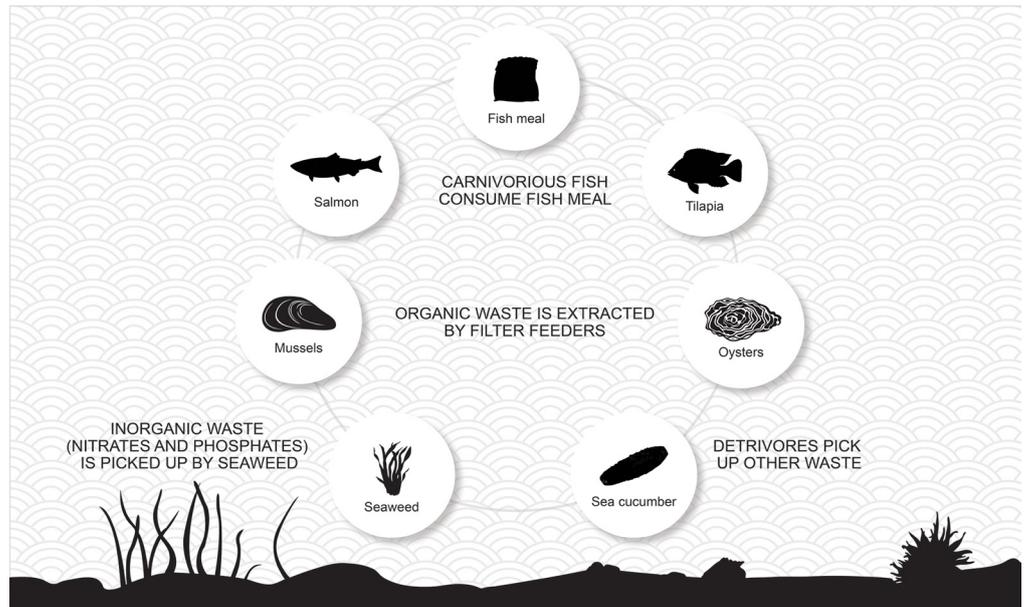


Figure 3 Integrated Marine Trophic Aquaculture (IMTA)
Infographic: Morgan Richards; copyright Elspeth Probyn; reproduced with permission.

IMTA is a practice in which the by-products (wastes) from one species are recycled to become inputs (fertilizers, food and energy) for another. Fed aquaculture species (e.g. finfish/shrimps) are combined, in the appropriate proportions, with organic extractive aquaculture species (e.g. suspension feeders/deposit feeders/herbivorous fish) and inorganic extractive aquaculture species (e.g. seaweeds) for a balanced ecosystem management approach.⁸⁹

The Chinese are the undisputed leaders in conceptualising and implementing scaled-up IMTA systems. In 2010 China produced 65 per cent of total aquaculture output in the world, 80 per cent of shellfish production and 59 per cent of seaweed. Per capita, the Chinese eat 50 per cent more fish than Americans. The country's 1.4 billion citizens eat more fish than those of the next ten biggest countries combined.⁹⁰ The size of the aquaculture area is astonishing—to be economically viable it has to be at least 100 square kilometres, about the size of a small town.⁹¹ The islands around Zhangzi produce 60,000 tonnes of kelp, mostly as a by-product that is sold locally. The real money is in the 200 tonnes of sea urchins, 300 tonnes of oysters, 700 tonnes of sea snails, 2,000 tonnes of abalones and a whopping 50,000 tonnes of scallops raised a year. For instance, Sungo (Sanggou) Bay consists of 130,000 hectares—130 square kilometres—of combined aquaculture production. In this system, typically the feed goes to the carnivorous fish, which produces organic and inorganic waste.⁹² Extractive filter feeders such as mussels or oysters eat the organic waste, and algae consume the inorganic (nitrates and phosphorous). At the bottom a detritivore—an eater of detritus—such as the sea cucumber picks up the rest.

⁸⁹ Ibid., p. 7.

⁹⁰ Erik Vance, 'China's Fish Farms Could Save the Oceans', *Scientific American*, 1 April 2015.

⁹¹ Ibid.

⁹² M. Troell, A. Joyce, T. Chopin, A. Neori, A.H. Buschmann and J-G. Fang, 'Potential for Integrated Multi-trophic Aquaculture (IMTA) in Marine Offshore Systems', *Aquaculture*, no. 297, 2009, pp. 1–9.

Other species such as lobster are also detritivores, and could potentially be brought into the IMTA system. IMTA is an attempt to more closely learn and copy from nature. ‘Cultivating more than one trophic level such that the wastes from fed organism such as fish are recaptured and converted to fertilizer, food and a source of energy for other crops ... would mimic aspects of the more complex marine communities seen in nature.’⁹³

In terms of its mimetic approach to representing an alternative fish-related environment, IMTA is an interesting experiment. It tinkers with the past, and rescales to the future. It is of course not the panacea for the problems of ensuring sustainable oceans and fish. But it is another sort of ‘mess’, akin to the one that Schlunke describes as producing a network of events and objects. As a representation, it is fascinating, and it enables connections to be made between and among trophic levels. It also replays an historical technology of more-than-human fish existence. As IMTA reproduces in a wildly different form the ancient practices of polyculture, it brings to mind Annemarie Mol and John Law’s take on more-than-human kind of ‘metabolic intimacy’.⁹⁴

Why represent a fish?

In this article, we have travelled athwart several issues. I have attempted to explore a number of representations of fish conducted by marine scientists of different specialties. I’ve done so from the framework of my own discipline, cultural studies, bearing in mind the classic distinction between representation as portrait and proxy. I have hoped to bring out the nuances of fish and of fish-relatedness and, influenced by Abrahamsson et al., I ultimately argue for other ways of approaching hugely complex ecological issues. In their sense, I have ‘tinkered’ with the idea of representation, pulling it away from the purely textual to explore how we might complicate the representation of fish. I take to heart arguments about how the sea is being radically simplified in terms of biodiversity. At the same time, across public debates, some academic research and through NGO campaigns—such as the panda-masked bluefin tuna one—our public understanding of fish and fish-related matters is being seriously simplified. As I have argued more extensively elsewhere, to respond to the global state of fishing by saying ‘don’t eat fish’ just doesn’t cut it.⁹⁵ Twenty-five percent of the global fish catch goes to putatively nonhuman consumption—this includes the fish that go to feed other fish, and animals, as well as the ones that end up in organic fertilizer to feed vegetables.

I hope to have introduced some of the disparate and competing models of what ‘fish’ are and what they can and should ‘be’ in the future. Scientific and ecological models insist that numbers, quality and eco-sustainability are what matter; local fishing communities value economic viability, traditional practice-based knowledge, and ways of life; consumers operate in budget-defined regimes of commodified ‘taste’ and ‘choice’. Each of these spheres brings to the table radically different models of what ‘fish’ represent and what they ‘do’ in deeply implicated, mutually dependent, networks of inter-relation.

93 Lesley Evans Ogden, ‘Aquaculture’s Turquoise Revolution: Multitrophic Methods bring Recycling to the Seas’, *BioScience*, vol. 63, no. 9, 2013, p. 700.

94 John Law and Annemarie Mol, ‘Globalisation in Practice: On the Politics of Boiling Pigswill’, *Geoforum*, vol. 39, no. 1, 2008.

95 Probyn, *Eating the Ocean*.

I don't expect everyone to become passionate about fish—cultural studies scholars are busy in their own areas of passion, and don't have the time or inclination to trawl through the sometimes-alien worlds of fish sciences. Of course, this article is far from a comprehensive view of these disciplines, where debates among and between scholars are rife—they are academics too. But taking my lead from the ichthyart critics, the Moyles, and their brilliant idea of categorising fish and art, I have described a few central representations of fish in marine sciences. While Reis and Hibbeln's arguments about omega 3-induced emotions are at considerable odds to the affective research undertaken in cultural studies, I love their passion and the desire to understand why so many religions feature fish. I take heed from Abrahamsson et al.'s critique of Bennett's too hasty leap from claims to facts, and attempt to present 'the facts' of my fish representations as flatly as possible.

But ... it seems late in the piece to point out the obvious—fish cannot speak in any way that is comprehensible to humans. The question of the representation of fish thus inevitably bypasses the central player, the 'privileged client' of fisheries management—the fish. I am very cognisant that the fish that swim across this article are mute as to their own being. These representations speak of what the fish is for humans—whether it be as food, or as cognitive and affective mnemonics.

As Cary Wolfe and many others exhort, surely it is time to break up the 'we' who is always human-centred. Wolfe takes up the challenge of seeing 'the animal question' in art, where reflecting on contemporary 'animal' art he launches this challenge: 'of speaking *for* non-human animals, speaking *to* our relation to them, and how taking those relations seriously unavoidably raises the question of who "we" are ...'.⁹⁶ Of course, in 'the age of the human' there is no lack of discussion about whether the human is de- or re-centred. As Bronislaw Szercznski asks, is the Anthropocene 'the epoch of the apotheosis, or of the erasure, of the human as the master and end of nature?'⁹⁷

As I pondered the enormity of this, and wondered how to imagine a representation that unhinged the human, a fish jumped out at me. It is this beautiful fossil, a *Diplomystus dentatus*. Wikipedia tells me, 'it is an extinct genus ... distantly related to modern-day extant herrings, alewives, and sardines'.⁹⁸ She was sitting on my desk, seemingly waiting for me to notice her.⁹⁹ And now that I have, she troubles me, and my argument.

The fossil is, of course, not a representation in any of terms with which this article has engaged. The fossil is in the present but the fish is from about fifty million years ago. Along with other *Diplomystus dentatus*, the fossil/fish is from the Eocene Epoch and would have swum in the huge lake network that is now called the Green River in Wyoming. And she was/is related to the Clupeidae, my favourite family of fish—the little fish that may save the more-than-human

96 Cary Wolfe, 'From Dead Meat to Glow in the Dark Bunnies: Seeing 'the Animal Question' in Contemporary Art', *Parallax*, vol. 12, no. 1, 2006, p. 96.

97 Bronislaw Szercznski, 'Reading and Writing the Weather', *Theory, Culture and Society*, vol. 27, nos 2-3, 2010, p. 16, cited in Kathryn Yusoff, 'Geologic Life: Prehistory, Climate, Futures in the Anthropocene', *Environment and Planning D: Society and Space*, vol. 31, 2013, p. 783.

98 'Diplomystus', *Wikipedia*, <<https://en.wikipedia.org/wiki/Diplomystus>>.

99 A wandering fish fossil, I had given it to my father who lived on the Welsh border. After he died she came back with me to Australia. The ticket on the back gives the scientific details as well as the address of the Brilliant Gems and Opals Shop in Gosford, New South Wales, where someone obviously bought it and it was re-sold in Sydney.



Figure 4 *Diplomystus dentatus*
Photograph: Elspeth Probyn

marine ecosystem.¹⁰⁰ The sheer age of this relatively young fossil begins to disturb any primary focus on human activity—it makes ‘us’ seem so small. And in some arguments, it may refigure that ‘us’. Gisli Pálsson and Heather Anne Swanson formulate a framing of geology and sociality, which they call geosocialities, to explore how ‘the geologic itself become inscribed in bodies, making its way inside living beings, both human and nonhuman’.¹⁰¹ Kathryn Yusoff goes conceptually beyond a melding of the geo and the social to argue that fossils are ‘a tiny bone record of a much larger life that has moved on without trace’.¹⁰² This refigures my fish fossil as an immensely singular object—an optic into a world supremely indifferent to humans. Yusoff continues: ‘[the fossil] has power precisely because it is a trace-like entity, a fragment that provokes narrative constellations that shift (and sometime “split”) the classificatory order of things’.¹⁰³

The body of *Diplomystus dentatus* does indeed trouble things. Akin to Schlunke’s experimentation with ‘mess’, this fish fossil engages ‘a network of events, objects and associations that challenge ordinary orders of representation’.¹⁰⁴ Patricia Piccinini’s thoughts about the blobfish echo through my mind: ‘I made it because I want to commemorate [the fish’s] passing. It is a quiet work, not histrionic.’¹⁰⁵ The fish fossil reminds us that while a fish’s passing may be quiet, it is certainly not straightforward. It silently prods at me to do better in representing fish.

100 Probyn, *Eating the Ocean*.

101 Gisli Pálsson and Heather Anne Swanson, ‘Down to Earth: Geosocialities and Geopolitics’, *Environmental Humanities*, vol. 8, no. 2, 2016, p. 160.

102 Yusoff, p. 788.

103 Ibid.

104 Schlunke.

105 Patricia Piccinini website, <<http://www.patriciapiccinini.net/writing/30/310/100>>.

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Bibliography

- Abrahamsson, S., F. Bertoni, A. Mol and R. Ibáñez Martín. 'Living with Omega-3: New Materialism and Enduring Concerns', *Environment and Planning D: Society and Space*, vol. 33, no. 1, 2015, pp. 4–19. <https://doi.org/10.1068/d14086p>
- Altman, J., 'Eastern Gunwinggu Fish Trapping at Gunbatgarri', *The Beagle: Occasional Paper of the Northern Territory Museum of Arts and Sciences*, vol. 1, no. 7, 1983, pp. 59–71.
- Barclay, K., *A Japanese Joint Venture in the Pacific: Foreign Bodies in Tinned Tuna*, Routledge, London, 2008. <https://doi.org/10.4324/9780203930908>
- Barclay, K., 'The Social in Assessing for Sustainability: Fisheries in Australia', *Cosmopolitan Civil Societies: An Interdisciplinary Journal*, vol. 4, no. 3, 2012, pp. 38–53. <https://doi.org/10.5130/ccs.v4i3.2655>
- Bear, C. and S. Eden, 'Making Space for the Fish: The Regional, Network and Fluid Spaces of Fisheries Certification', *Social & Cultural Geography*, vol. 9, no. 5, 2008, pp. 487–504. <https://doi.org/10.1080/14649360802224358>
- Bear, C. and S. Eden, 'Thinking Like a Fish? Engaging with Nonhuman Difference through Recreational Angling', *Environment and Planning D: Society & Space*, vol. 29, 2011, pp. 336–52. <https://doi.org/10.1068/d1810>
- Bennett, J., *Vibrant Matter: A Political Ecology of Things*, Duke University Press, Durham, North Carolina, 2010.
- Borges, J. L., *Other Inquisitions 1937–1952*, University of Texas Press, Houston, 1993.
- Cardozo, K. and B. Subramaniam, 'Assembling Asian/American Naturecultures: Orientalism and Invited Invasions', *Journal of Asian American Studies*, vol. 16, no. 1, 2013, pp. 1–23. <https://doi.org/10.1353/jaas.2013.0006>
- Carson, R., *The Sea Around Us*, Oxford University Press, Oxford, 1951.
- Dekoven, M., 'Why Animals Now?', *PMLA*, vol. 124, no. 2, 2009, pp. 361–9. <https://doi.org/10.1632/pmla.2009.124.2.361>

- Fleishman, S., 'The Omega Man', *Bethesda Magazine*, November–December 2012. <http://www.bethesdamagazine.com/Bethesda-Magazine/November-December-2012/Omega-3/>
- Foucault, M., *The Order of Things*, Pantheon, New York, 1970.
- Foucault, M., 'Ceci n'est pas une pipe', trans. R. Howard, *October*, vol. 1, 1976, pp. 6–21.
- Froese, R. and D. Pauly (eds), 'Psychrolutes marcidus', FishBase website, 2010, <http://www.fishbase.se/summary/Psychrolutes-marcidus.html>
- Garrity, E.J., 'System Dynamics Modeling of Individual Transferable Quota Fisheries and Suggestions for Rebuilding Stocks', *Sustainability*, vol. 3, no. 1, 2011, pp. 184–215. <https://doi.org/10.3390/su3010184>
- Graham, M., 'Modern Theory of Exploiting a Fishery, An Application to North Sea Trawling', *Journal de Conseil International pour l'Exploration de la Mer*, vol. 10, 1935, pp. 264–74. <https://doi.org/10.1093/icesjms/10.3.264>
- Helgason, A. and G. Pálsson, 'Contested Commodities: The Moral Landscape of Modernist Regimes', *Journal of the Royal Anthropological Institute*, vol. 3, 1997, pp. 451–71. <https://doi.org/10.2307/3034762>
- Howarth, L., C.M. Roberts, R.H. Thurstan and B.D. Stewart, 'The Unintended Consequences of Simplifying the Sea: Making the Case for Complexity', *Fish and Fisheries*, vol. 15, no. 4, December 2014, pp. 690–711. <https://doi.org/10.1111/faf.12041>
- Janson, H.W., *Janson's History of Art: The Western Tradition*, Harry N. Abrams, Inc., New York, 1969.
- Kessler, C.S., 'Science and Mysticism in Paul Klee's *Around the Fish*', *The Journal of Aesthetics and Art Criticism*, vol. 16, no. 1, September 1957, pp. 76–83. <https://doi.org/10.2307/427128>
- Key, B., 'Why Fish do Not Feel Pain', *Animal Sentience*, vol. 3, no. 1, 2016, pp. 1–34.
- Kim, C.J., *Dangerous Crossings: Race, Species, and Nature in a Multicultural Age*, Cambridge University Press, Cambridge, 2015. <https://doi.org/10.1017/CBO9781107045392>
- Latour, B. and P. Weibel, *Making Things Public: Atmospheres of Democracy*, MIT Press, Cambridge, MA, 2005.
- Law, J. and A. Mol., 'Globalisation in Practice: On the Politics of Boiling Pigswill', *Geoforum*, vol. 39, no. 1, 2008, pp. 133–43. <https://doi.org/10.1016/j.geoforum.2006.08.010>
- Lien, M.E. and J. Law, "'Emergent Aliens": On Salmon, Nature and their Enactment', *Ethnos*, vol. 76, no. 1, 2011, pp. 65–87. <https://doi.org/10.1080/00141844.2010.549946>
- Lund, V., C.M. Mejdell, H. Röcklinsberg, R. Anthony and T. Håstein, 'Expanding the Moral Circle: Farmed Fish as Objects of Moral Concern', *Diseases of Aquatic Organisms*, no. 75, 2007, pp. 109–18.
- Lynch, M. and S. Woolgar, 'Sociological Orientations to Representational Practice in Science', *Human Studies*, vol. 11, nos 2–3, 1988, pp. 99–116. <https://doi.org/10.1007/bf00177300>
- Moreton-Robinson, A., *Talkin' Up To the White Woman: Indigenous Women and Feminism*, University of Queensland Press, Brisbane, 2001.
- Moyle, P.B. and M.A. Moyle, 'Introduction to Fish Imagery in Art', *Environmental Biology of Fishes*, no. 31, 1991, pp. 5–23.
- Pálsson, G. and A. Helgason, 'Figuring Fish and Measuring Men: The Individual Transferable Quota System in the Icelandic Cod Fishery', *Ocean and Coastal Management*, vol. 28, nos 1–3, 1995, pp. 117–46. doi: [https://doi.org/10.1016/0964-5691\(95\)00041-0](https://doi.org/10.1016/0964-5691(95)00041-0)

- Pálsson, G. and H.A. Swanson, 'Down to Earth: Geosocialities and Geopolitics', *Environmental Humanities*, vol. 8, no. 2, 2016, pp. 149–71. <https://doi.org/10.1215/22011919-3664202>
- Pauly, D. and I. Tsukayama, 'The Peruvian Anchoveta and its Upwelling Ecosystem: Three Decades of Change', *ICLARM Studies and Reviews*, no. 15, 1987.
- Pauly, D., V. Christensen, J. Dalsgaard, R. Froese and F. Torres, 'Fishing Down Marine Food Webs', *Science*, vol. 279, no. 5352, 1998, pp. 860–3. <https://doi.org/10.1126/science.279.5352.860>
- Piccinini, P., *Patricia Piccinini* website, <http://www.patriciapiccinini.net>
- Potter, E., 'Climate Change and the Problem of Representation', *Australian Humanities Review*, no. 46, May 2009, <http://australianhumanitiesreview.org/archive/Issue-May-2009/potter.htm>
- Probyn, E., *Blush: Faces of Shame*, Minnesota University Press, Minneapolis, 2000.
- Probyn, E., *Eating the Ocean*, Duke University Press, Durham, 2016. <https://doi.org/10.1215/9780822373797>
- Probyn, E. 'Is Fish Meat?', in *Meat: A Transnational Exploration*, ed. S. Chatterjee and B. Subramaniam, Durham, Duke University Press, (forthcoming).
- Probyn-Rapsey, F., 'Dingos and Dog-whistling: A Cultural Politics of Race and Species in Australia', *Animal Studies Journal*, vol. 4, no. 2, 2015, pp. 55–77.
- Reis, L.C. and J.R. Hibbeln, 'Cultural Symbolism of Fish and the Psychotropic Properties of Mega-3 Fatty Acids', *Prostaglandins, Leukotirenes and Essential Fatty Acids*, no. 75, 2006, pp. 277–36.
- Schlunke, K., 'Hometown: Sustainable Queerness in the More-than-human Country Town'. in *Cultural Sustainability in Rural Communities: Rethinking Australian Country Towns*, ed. C. Driscoll, K. Darian-Smith and D. Nichols, Routledge (forthcoming).
- Spivak, G.C., 'Can the Subaltern Speak?', in *Marxism and the Interpretation of Culture*, ed. C. Nelson and L. Grossberg, University of Illinois Press, Urbana, 1988, pp. 271–315. https://doi.org/10.1007/978-1-349-19059-1_20
- St Martin, K., 'The Difference that Class Makes: Neoliberalization and Non-Capitalism in the Fishing Industry of New England', in *Privatization: Property and the Remaking of Nature-Society Relations*, ed. B. Mansfield, Blackwell, New York, 2008. <https://doi.org/10.1002/9781444306750.ch6>
- Troell, M., A. Joyce, T. Chopin, A. Neori, A.H. Buschmann, J-G. Fang, 'Potential for Integrated Multi-trophic Aquaculture (IMTA) in Marine Offshore Systems', *Aquaculture*, no. 297, 2009, pp. 1–9.
- Vance, E., 'China's Fish Farms Could Save the Oceans', *Scientific American*, vol. 312, no. 4, 1 April 2015, <https://www.scientificamerican.com/article/china-s-fish-farms-could-save-the-oceans/>
- Vannini, P., 'Nonrepresentational Theory and Symbolic Interactionism: Shared Perspectives and Missed Articulations', *Symbolic Interaction*, vol. 32, no. 3, 2009, pp. 282–6. <https://doi.org/10.1525/si.2009.32.3.282>
- Wadiwel, D., 'Do Fish Resist?', *Cultural Studies Review*, vol. 22, no. 1, 2016, pp. 196–244. <https://doi.org/10.5130/csr.v22i1.4363>
- Wadiwel, D., Commentary on Key on Fish Pain 1, 'Fish and Pain: The Politics of Doubt' *Animal Sentience*, vol. 3, no. 31, 2016, pp. 108.
- Watson, R. and D. Pauly, 'Systematic Distortions in World Fisheries Catch Trends', *Nature* vol. 414, 29 November 2001, pp. 534–6. <https://doi.org/10.1038/35107050>
- Watt, S., *The Ugly Animals: We can't all be Pandas*, The History Press, Stroud, 2014.



Wolfe, C., 'From Dead Meat to Glow in the Dark Bunnies: Seeing 'the Animal Question' in Contemporary Art', *Parallax*, vol. 12, no. 1, 2006, pp. 95–109. <https://doi.org/10.1080/13534640500448775>

Yusoff, K., 'Geologic Life: Prehistory, Climate, Futures in the Anthropocene', *Environment and Planning D: Society and Space*, vol. 31, 2013, pp. 779–95. <https://doi.org/10.1068/d11512>