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OBITUARY

Nothing so boundless, nothing so patient: Obituary for Professor Jeffrey Alexander Hutchings (1958–2022)

FIGURE 1 Jeff Hutchings 1958–2022

It is difficult to overstate the profound impact that Professor Jeffrey A. Hutchings (Figure 1). Hutchings had on fisheries science, life-history theory, the science–policy interface and those who had the honour and pleasure of knowing him. Jeff died at his home on January 29, 2022 at the age of 63. Jeff's unexpected death crushed us. We knew him as an incredibly kind, supportive and authentic man, in possession of extraordinary scientific knowledge, unparalleled communication skills and exceeding generosity. Our thoughts are with his family, friends, colleagues and students in this unimaginably difficult time. Here, we offer some reflections on Jeff's extraordinary journey and legacy as a scientist, leader, storyteller, colleague and mentor. The title of this article is borrowed from 19th century Norwegian writer Alexander Kielland's description of the sea (Kielland, 1885), but it perhaps just as well describes Jeff's boundless capacity and patient pursuit of the truth that lies beneath the waves.

Growing up in Orillia, Ontario, Canada, Jeff was perhaps more well known in his community for his good humour, musicianship and athleticism than for his scholarship. Nevertheless, his attention gradually shifted from his high school musical comedy group 'The Flying Shorts' towards ecology and fish biology during his undergraduate studies at the University of Toronto. But to those who knew him, "regular Jeff" or "Rock" as he was known to his childhood friends, persisted amid all of his professional success and accolades.

After connecting with his paternal roots in Newfoundland during childhood holiday visits (Figure 2), Jeff returned there for his master's and PhD at Memorial University where he studied brook trout life histories at Cape Race. Some say he never wanted to leave "The Rock" (coincidence?). But, always seeking to broaden his horizons, he took up a postdoctoral fellowship on *Drosophila* reproductive trade-offs at the University of Edinburgh under the mentorship of Linda Partridge. Throughout these formative years, Jeff taught himself quantitative genetics from textbooks. Indeed, it was his fundamental interest and understanding of life-history evolution and genetics that provided the substrate for his unique contributions to applied fisheries science as a Professor at Dalhousie University.

Jeff's early research on salmonids and marine fishes in Canada is widely known and continues to inspire new generations of students and scientists. He wrote a large number of scientific papers (250 articles in the primary scientific literature) of both fundamental and applied value. An evolutionary ecologist by training, he has left his indelible mark in several fields of knowledge, including the evolution of life-history traits, the evolutionary and adaptive significance of phenotypic plasticity, the study of mating systems and reproduction, population dynamics and the study of speciation with a predilection for fish as study systems. But many will probably remember most of all the application of this fundamental knowledge in the fields of fisheries science, fisheries management, evolution induced by

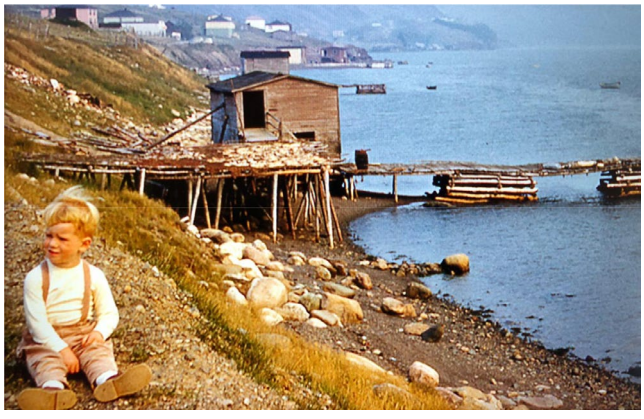

FIGURE 2 Jeff Hutchings as a child on holiday in Newfoundland

selective (over)harvesting, interactions between farmed and wild salmon and the conservation of marine biodiversity (Figure 3).

In addition to having chaired an expert panel on the impacts of climate change, fisheries and aquaculture on Canadian marine biodiversity, which led to the publication of a landmark report by the Royal Society of Canada in 2012, he also chaired the Committee on the Status of Endangered Wildlife in Canada (COSEWIC). On top of this, Jeff was co-founder and later president of the Canadian Society for Ecology and Evolution (CSEE/SCEE). For all of his contributions to science and society, Jeff was elected a Fellow of the Royal Society of Canada in 2015 and, in 2017, he received the AG Huntsman Award for Excellence in the Marine Sciences. In acknowledgement of his transatlantic contributions to marine science, he was elected a member of the Norwegian Academy of Sciences and Letters in 2018.

Jeff was able to use his unique overview and linking of fundamental biological principles to greatly improve our understanding of how exploitation by humans can change the dynamics of marine fish populations, including what determines the thresholds for recovery of depleted populations and how fisheries may change the course of evolution and the long-term productivity of wild fish. His first posthumous paper (Perälä et al., 2022), published in early February 2022, shows empirical evidence for Allee effects in a Newfoundland cod population, which "contrast[s] with prevailing fisheries management practices that assume compensatory dynamics at low abundances with potential to seriously overestimate the recovery potential of collapsed populations" – an important paper that provides a framework for quantification of Allee effects and constitutes yet another significant contribution to fisheries science.

In parallel with these ecological narratives, Jeff always considered the evolutionary consequences of small population sizes and the genetic architecture underlying life-history traits. Therefore, he was also able to realize the potential of genomics for understanding life-history evolution and adaptation to climate in fishes. For instance, in one of his first "intrusions" into the realm of functional genomics some 12 years ago, he co-led a project with several Canadian colleagues aiming at documenting the population-specific gene expression responses to hybridization between farmed and wild Atlantic salmon. In more recent years, he has collaborated with genomicists and theoreticians to understand the role of life-history trait architecture in responses to environmental change in salmon and cod.

FIGURE 3 George Lilly, Ram Myers, Jeff Hutchings, Department of Fisheries & Oceans, St. John's, Newfoundland, December 1994. Photograph taken in JH's office, commemorating their receipt of the 1993 Wilfred Templeman Publication Award for Hutchings et al. (1993)

Besides his wealth of research contributions, Jeff also stood up for, and believed passionately in, the importance of policy decisions being guided by unbiased science. This belief was something he maintained all his life, and he was not afraid of stating his opinion regardless of whether it was popular. A major highlight and particularly eloquent moment of his strong stance against the lack of consideration for the importance of science by the political class was the very inspiring speech he gave in 2012. In the presence of more than 1000 scientists at an historic rally before the Parliament of Canada (the largest of its kind in Canadian history), Jeff denounced the denigration of science and the muzzling of federal government scientists by the government of the time.

Recently, he gave a talk at the Institute of Marine Research in Norway where he told the story of how he, as an early career researcher, became – more or less by chance – directly involved in the Northern cod crisis. After carefully analysing the available data, he went on to publicly communicate that overfishing was the root cause of the most profound fisheries collapse in human history. This contradicted the position held by the authorities – that unfavourable environmental conditions and seal predation was to blame. The controversy that ensued placed the young scientist under tremendous pressure. But he stood his ground, as he was certain the scientific evidence supported his conclusion.

These are among the experiences chronicled in a text Jeff published as a "story from the front lines" in ICES Journal of Marine Science on January 10, 2022, only 19 days before his unexpected death (Hutchings, 2022). The article exemplifies how Jeff was a prolific scientific writer and, at the same time, a storyteller. His writings are elegant and sophisticated, and he believed in delivering scientific texts in engaging prose, something he was adept at helping others with. But he is at least equally known for his unwavering ability to listen. All those who knew Jeff more closely will describe him as a quick-witted, erudite and affable person who always listened to his interlocutor, the kind of listening that makes you feel important! The dozens of students, colleagues and friends who have expressed their great sadness on social media at seeing him go too quickly are full of praise for what an extraordinary human being he was. He has certainly been and will continue to be a great source of inspiration that has motivated members of our scientific community to speak out on the inaction or unjustifiable actions of decision makers in a conservation context.

While being a proud Canadian foremost, Jeff also had a soft spot for Norway. He was interested in Norwegian art such as Munch, writers such as Kielland, Loe, Hauge and Knausgaard and pioneer scientists such as Hjort. Jeff's interest in Norway (and *vice versa*) led to positions at the University of Oslo, Institute of Marine Research

and the University of Agder, where he had an important mentor role, particularly in the Centre for Coastal Research since 2012. Jeff's death is a tremendous loss for academia and fisheries science in Norway. We have learned a lot from Jeff, not only about science, but also about how to build solid processes in difficult matters, with inclusivity of people and opinions at the forefront. He was rarely the loudest in the room. He was not pushy. He patiently manoeuvred diverse groups towards solutions to complex problems in a way that kept everyone on board. These sentiments have been echoed internationally by colleagues that shared many a committee or panel with him. They reflect an ideal which more leaders would do well to aspire to.

Jeff's exceptional capacity for research and mentorship is underscored by his major involvement in a third northern country – Finland. As Docent at the University of Jyväskylä, he worked closely with the lab group of his loving partner in work and life, Anna Kuparinen. Their shared passion for fish life histories and long forest walks had a non-additive effect on their scientific community, in which the whole was greater than the sum of its parts. Such a coalescence of minds is a rare and wondrous thing.

No matter the country he was in, Jeff always impressed by enthusiastically taking time to talk with scientists at all levels, and with an insight few can ever obtain. But more than merely pointing the way, Jeff had a way of stimulating reflection that helped people find their own way. The positive impacts of this on a mentee or colleague's development, confidence and motivation cannot be overstated. A meeting with Jeff always left one with a feeling of excitement and determination – that *it*, whatever *it* was, was possible and that you were the one(s) who could make it happen.

Jeff's vast scientific legacy lives on in the 70 students and postdocs he formally mentored in wide-ranging research projects and career paths, many of whom are government scientists and professors today. Countless others have benefitted from his exceptional teaching and informal counsel. He prioritized his precious time towards helping people – understand, grow, communicate – to help our oceans and society, in turn. Jeff was also very good at returning favours done to himself. For those who helped him advance through his career by writing letters of support, he returned the favour by helping them either by offering to read draft papers or by seeing that they were invited to important meetings. It is now through these people that his scientific and political legacy continues to improve the well-being of our planet and those who reside here. It is clear that he will be dearly and truly missed around the world.

The last word can be given to Jeff himself. In 2021, Jeff published with Oxford University Press *A primer of life histories. Ecology, evolution, and application* (Hutchings, 2021). At the end of the acknowledgements, Jeff wrote that he owed his greatest thanks to his PhD supervisor Douglas Morris "… for impressing upon me the importance of intellectual honesty, academic integrity, respectful interactions with others, and asking questions of fundamental importance". This could be taken as his own summary of his lasting contribution to science and to humanity. He followed his supervisor's advice to the letter.

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