

DAVID SHAFER

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EDUCATION

1998 PhD in Zoology (Marine Ecology) University of Hawai'i, Honolulu, Hawai'i
1987 BA in Biology, Wabash College, Crawfordsville, Indiana: Eli Lilly Scholar

PRIMARY RESEARCH

My research focuses on the population ecology and recruitment dynamics of fishes and the influences of various environmental factors, especially ocean temperature on those dynamics. This work utilizes state-of-the-art otolith techniques to reconstruct life history information, combined with techniques from biological, physical, and fisheries oceanography. This research has implications for 1) understanding the basic ecology of marine populations, 2) the effects of seasonal, episodic (e.g., ENSO), and long term (e.g., global warming) shifts in ocean temperature on populations, and (3) the application of this research to conservation, resource management, and policy.

Research Specialist 2003 – 2004
University of Hawai'i, Honolulu Hawaii

Research on the recruitment dynamics of keystone marine organisms in a system of marine protected areas (MPAs) on West Hawai'i (West Hawai'i Aquarium Project). This work, funded by the Hawaii Coral Reef Initiative (Sea Grant), focused on the spatial and temporal patterns of recruitment in marine protected areas, specifically on the recruitment dynamics of economically important fishes in the aquarium industry.

Contract Research Specialist 1996 – 2003
Post-Doctoral Fellow 1999 – 2001
School of Ocean and Earth Science and Technology, UH, Honolulu, Hawai'i

Use of trace element analysis of otoliths to reconstruct migratory pathways of larval cod in the Gulf of Maine. This work, funded by the National Science Foundation, used micro-chemical signatures in the otoliths of larval cod, combined with sea surface temperature data to hindcast larval migrations, with the intended goal of contributing to our understanding of the importance of spawning stocks of cod on the Scotian Shelf, Canada to recruitment to Georges Bank, U.S.A.

Life history of high arctic anadromous charr in Greenland. This work, funded by the National Science Foundation, examined chemical signatures in the otoliths of migratory charr to reconstruct the timing and frequency of migrations between freshwater and seawater for this anadromous fish.

Use of anthropogenic lead isotope tracers in otoliths of fish in Kane'ohe Bay, O'ahu to evaluate the importance of nursery grounds inside Kane'ohe Bay. This work used lead stable isotope signatures in the otoliths of reef fishes to establish site fidelity. Results from this kind of study can be useful for the design of MPAs.

Use of elemental fingerprints in otoliths of fish from the main Hawaiian Islands and Northwest Hawaiian Islands to identify population sources. This work, funded by NOAA Fisheries, was a pilot study for developing a stock identification tool for fisheries management.

Graduate Research Assistant Sep 1992 - Dec 1998

School of Ocean and Earth Science and Technology, UH, Honolulu, Hawai'i.

Research on the life history and population dynamics of fishes in freshwater and marine environments. Studied populations of fishes ranging from the Arctic to the Antarctic. Developed and refined techniques in retrospective otolith analysis.

MARINE RESOURCE MANAGEMENT

Marine Resource Specialist 2001 – 2004

Sustainable Resources Group International, Inc., Honolulu, Hawai'i

Coral Reef Ecosystem Management Study (CREMS): Marine Corps Base Hawai'i (MCBH) Co-authored the first coral reef ecosystem study for MCBH, which adopted an ecosystem approach to integrating divergent stakeholder concerns, ecological criteria, and military mission.

Northwestern Hawaiian Islands (NWHI) Ecosystem-Based Management: Reviewed fishing regulations for Sanctuary designation of the Northwestern Hawaiian Islands and promoted an ecosystem based approach toward managing the NWHI. This work helped lead to the eventual designation of the NWHI as a National Marine Monument, the largest protected marine ecosystem in the world.

TEACHING & OUTREACH

Biology Instructor Spring Terms 1992 – 1994

Kansai Gaidai University, Hawai'i Campus, Honolulu, Hawai'i: Undergraduate instruction in General Biology with an emphasis on marine systems. 150 lecture hours.

Graduate Teaching Assistant Spring Terms 1992 - 1993

University of Hawai'i, Department of Zoology, Honolulu, Hawai'i: Undergraduate laboratory instruction in Comparative Animal Physiology.

Field Leader January 2001

Oceans of Potentiality, Honolulu, Hawai'i: Coordination of the Hawaiian stream fish component of a field camp in Waimanu Valley, Hawai'i.

PUBLICATIONS

Claisse JT, M Kienzle, ME Bushnell, **DJ Shafer** & JD Parrish (2009) Habitat- and sex-specific life history patterns of yellow tang *Zebrasoma flavescens* in Hawaii, USA. *Marine Ecology Progress Series* 389: 245-255

- Wilcox B, K Duin, J Shafer & **D Shafer** (2004) Results of the Fishing Discussion Group Process, Fall 2003: Fishing in the Proposed Northwestern Hawaiian Islands National Marine Sanctuary. Prepared for U.S. Department of Commerce, National Oceanographic and Atmospheric Administration, National Marine Sanctuary Program, Northwestern Hawaiian Islands Coral Reef Ecosystem Reserve. Prepared by Sustainable Resources Group Intn'l, Inc.
- Wilcox B, K Duin, J Shafer & **D Shafer** (2004) Supplementary Notes on Decision Criteria, Information Synthesis, and Findings: Fishing in the Proposed Northwestern Hawaiian Islands National Marine Sanctuary. Prepared by Sustainable Resources Group Intn'l, Inc.
- Basch L, **DJ Shafer**, W Walsh & J Eble (2003) Recruitment Dynamics And Early Life History Strategies Of Key Herbivorous Coral Reef Fishes In A Hawaiian MPA Network. *Abstracts 84th Meeting Western Society of Naturalists, Long Beach, CA – November 2003*
- Shafer, J.L., **D.J. Shafer**, K.N. Duin and H.M. Reed (2002) MCBH Coral Reef Ecosystem Management Study, Final Report. Prepared for Marine Corps Base Hawaii through Naval Facilities Engineering Service Center. Prepared by Sustainable Resources Group Intn'l, Inc.
- Radtke RL, RA Kinzie III & DJ Shafer (2001) Temporal and spatial variation in length of larval life and size at settlement of the endemic Hawaiian amphidromous goby, *Lentipes concolor*. *Journal of Fish Biology* 59: 928-938.
- Spencer K, **DJ Shafer**, EH DeCarlo & RW Gauldie (2000) Stable lead isotope ratios from petrol-lead additives in fish otoliths: a potential nursery ground stock marker. *Comparative Biochemistry and Physiology* 127: 273-284.
- Shafer DJ** (2000) Evaluation of periodic and aperiodic otolith structure and somatic-otolith scaling for use in reconstruction of the early life history of a tropical marine goby, *Bathygobius coalitus*. *Marine Ecology Progress Series* 199: 217-229
- Shafer DJ** (2000) Small changes in tropical ocean temperature can significantly influence reef fish early life history (abstract). *9th International Coral Reef Symposium* p. 42.
- Katayama S, RL Radtke, M Omori & **DJ Shafer** (2000) Coexistence of anadromous and resident alternative life history strategies of pond smelt, *Hypomesus nipponensis*, in Lake Ogawara, as determined by structural and chemical otolith analyses. *Environmental Biology of Fishes* 58: 195-201
- Shafer DJ** (1998) Early life history growth and settlement dynamics of a tropical reef fish (Gobiidae: *Bathygobius coalitus*). PhD Dissertation, Department of Zoology, University of Hawaii
- Shafer DJ** (1996) Spatial settlement patterns and ontogenetic habitat shifts of the tropical marine goby, *Bathygobius coalitus*, in intertidal zones (abstract). *Pacific Science* 50: 247
- McClaran MP, PO Ang Jr, A Capurro, DH Deutschman, **DJ Shafer** & J Guarini (1995) Interpreting explanatory processes for time series patterns: lessons from three time series. In: Powell TM, Steele JH (eds), *Ecological Time Series*. Chapman & Hall, New York, p 465-482
- Radtke RL & **DJ Shafer** (1992) Environmental sensitivity of fish otolith microchemistry. *Australian Journal of Marine and Freshwater Research* 43: 935-951
- Shafer DJ** (1991) The brown goby, *Bathygobius fuscus* (Gobiidae): responses to biological and physiochemical intertidal gradients (abstract). *Pacific Science* 45:102
- Radtke RL, AK Kellermann, **DJ Shafer** & JJ Ruzicka (1989) Early life histories of Antarctic fishes. *United States Antarctic Journal* 24: 194-196
- Radtke RL & **DJ Shafer** (1988) Age and growth estimates of the commercially important Antarctic fishes *Champsocephalus gunnari* and *Nothenia rossii* from South Georgia. *United States Antarctic Journal* 23: 142-143