

Paul James Struhsaker (1935–2018)

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DR. PAUL JAMES STRUHSAKER (Fig. 1), ichthyologist and fisheries biologist, died on July 25, 2018. He was born in Lansing, Michigan on July 16, 1935, to Frederick P. and Esther A. Struhsaker. Paul had one sister, Anne Larsen, and two brothers, Thomas and James Struhsaker. Paul grew up in a family with strong interests in the conservation and wise use of natural resources. His mother was a secretary for the State of Michigan Department of Natural Resources. His father was head of the Michigan Department of Conservation's Lands Division and secretary of the state's Conservation Commission, who, among his many other accomplishments, played a major role in the land acquisition and creation of the Porcupine Mountains State Park. Unfortunately, Paul's father died at the early age of 49, when Paul was only 18 years old.

Paul's interest in natural history became evident in his high school years when he kept snakes in a terrarium in his bedroom. From snake keeper, he went on to study for his Bachelor of Science in zoology, fisheries and wildlife management, and geology from Michigan State University. During the summer and early fall of 1957, while still an undergraduate, Paul worked as a fisheries aide for the U.S. Bureau of Commercial Fisheries (BCF) in Pascagoula, Mississippi.

Upon completing his B.Sc. in 1958, he was employed until 1965 by the South Atlantic Exploratory Fishing and Gear Research Station, BCF, in Georgia as a Fishery Methods and Equipment Specialist. In this position, he worked on trawling and dredging surveys to find new continental-shelf fisheries resources (Cummins et al., 1962a, 1962b; Struhsaker, 1969a). Although his employment was for fisheries research, one of his early publications was on the occurrence of the Minke Whale, *Balaenoptera acutorostrata*, near the Bahamas (Struhsaker, 1967). He subsequently worked with Harvey Bullis of the BCF Pascagoula, Mississippi laboratory on exploratory fisheries surveys, extending his trawling surveys into bathyal depths (Bullis and Struhsaker, 1970). Paul published two papers, including one in *Copeia*, on the life history of the Roughtail Stingray, *Bathytoshia centroura* (Bullis and Struhsaker, 1961; Struhsaker, 1969b). He also assisted with the development of new types of fishing gear. His collection of the deep-water fishes—*Barbourisia rufa*, *Melanocetus johnsoni*, and *Thaumatichthys binghami*, poorly-known at that time—resulted in his first ichthyological papers, with the first two published in *Copeia* (Struhsaker, 1962, 1965; Bertelsen and Struhsaker, 1977).

This was the beginning of Paul's long career in marine fisheries investigations that took him to the western North Atlantic, Gulf of Mexico, western Caribbean, Alaska, US west coast, and the Hawaiian Islands. He was an enthusiastic field biologist who enjoyed exploratory work at sea.

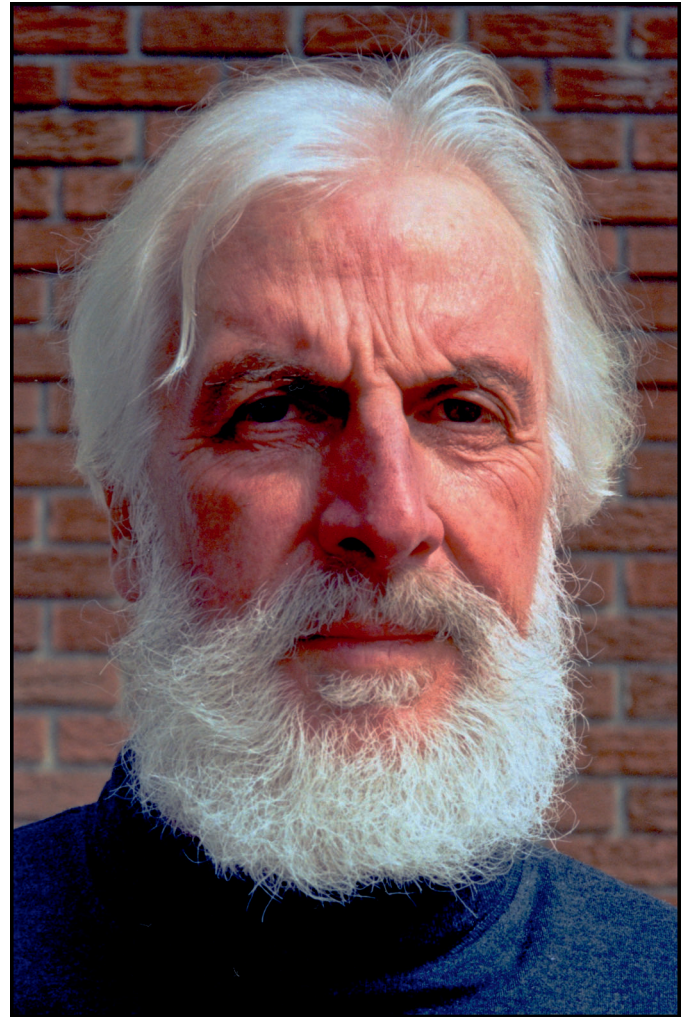


Fig. 1. Paul James Struhsaker at age 66 in 2002. Photograph by Rejeanne Courcelles.

Paul moved to Honolulu, Hawaii in 1965 for graduate school at the Hawaii Institute of Marine Biology, University of Hawaii. The subject of his master's (1967) degree was the identification of larval deep-sea anglerfishes (Ceratioidei) in a collection of 255 specimens taken by the Bermuda Expedition of the New York Zoological Society between 1929 and 1935. His Ph.D. dissertation committee consisted of Garth Murphy (Chair), Albert H. Banner, Philip Helfrich, John A. Maciolek, John E. Randall, and Ernst S. Reese. Paul's Ph.D. dissertation was effectively a small encyclopedia about deep-water fishes in the Hawaiian Islands (Struhsaker, 1973), resulting from his trawling surveys that explored potential deep-water shrimp populations (Struhsaker and Yoshida,

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1975). He presented a paper on his dissertation research, "Aspects of the ecology of Hawaiian bathyal fishes," at the 1969 American Society of Ichthyologists and Herpetologists meeting in New York (Highton, 1969).

From 1969–1977, he worked at the Southwest Fisheries Science Center, Honolulu Laboratory as a supervisory fisheries biologist and chief of the Honolulu Laboratory Fishery Development program. The exploration of Hawaii's shrimp resources also included gear development of new types of shrimp traps and surveys using them (Struhsaker and Aasted, 1974). In 1970, the BCF became the National Marine Fisheries Service (NMFS) of the National Oceanic and Atmospheric Administration (NOAA). While working at the NMFS Honolulu Laboratory, Paul became a research associate at the Bernice P. Bishop Museum. Many of his specimens were archived in that collection, where they became available to other taxonomists. Paul worked with Jack Randall on some of those (e.g., Randall and Struhsaker, 1971, 1976, 1981). Other specimens collected by Paul were placed in the collections of the U.S. National Museum of Natural History and the California Academy of Sciences.

Paul initiated and supervised the first studies to determine the age of tropical marine fishes using daily growth rings of sagittal otoliths (Struhsaker and Uchiyama, 1976; Uchiyama and Struhsaker, 1981). Three fish species have been named after him: *Glossanodon struhsakeri*; *Chromis struhsakeri*; and *Emmelichthys struhsakeri*. He described four species: *Argyripnus brocki*; *Naso maculatus*; *Lachneratus phasmaticus*; and the most famous, the Megamouth Shark, *Megachasma pelagios* (Fig. 2). There is an amusing story associated with the publication of the description of *Megachasma*, recounted in Daily (2008). The holotype was captured in 1976, but as often happens, there was a delay of several years before the manuscript describing it was finished. Colleagues became impatient with the delay and decided to prompt its completion. Two of them compiled a fake manuscript purporting to supersede Taylor, Compagno, and Struhsaker's description by pasting together unrelated Japanese text in manuscript form, which they sent to the authors as a supposed reprint. Leighton Taylor had the text translated and discovered the hoax, which spurred the completion and publication of the paper. The hoax is cryptically acknowledged in the Taylor et al. (1983: p. 110) as "particular thanks go to Richard Ellis and John McCosker for preparation of a preliminary manuscript which was of great help in the production of this final paper."

Paul collected the first specimens of many species that were described by others, including *Apogon deetsie*, *Aulotrachichthys heptalepis*, *Bathyroconger hawaiiensis*, *Epigonus devanyi*, *E. glossodontus*, *Gadella molokiensis*, *Leptobrotula breviventralis*, *Oxyurichthys heisei*, *Physiculus sterops*, and *Scorpaena pele*. The first recorded specimen of *Hexatrygon bickelli* was collected by Paul, but he did not publish his discovery of this specimen or describe this distinctive species (Struhsaker, 1973). He also reported the first records of several deep-water fishes from Hawaii, including an unidentified torpedo ray (the first of the family Torpedinidae found in the central Pacific), *Aulotrachichthys prosthemi*, *Benthodesmus tenuis*, *Gigantura indica*, *Kali normani*, *Kuronezumia bubonis*, *Maurolucus japonicas*, *Ophidion muraenolepis*, *Opisthoproctus soleatus*, *Plesiobatis daviesi*, *Rexea nakamuri*, *Saccogaster hawaii*, *Saurenchelys* sp., and *Uroconger lepturus*. He recognized that specimens of *Hime japonica* collected in Hawaii were actually



Fig. 2. Paul Struhsaker (right) and Leighton Taylor (left) taking morphometric measurements on the first known specimen and holotype of the Megamouth Shark, *Megachasma pelagios* Taylor, Compagno, and Struhsaker 1983. Photograph by Jeffrey M. Leis, © Jeffrey M. Leis and used with permission.

an undescribed species and in Struhsaker and Moncrief (1974) resurrected *Bothus thompsoni* from synonymy with *B. bleekeri*. While in Hawaii during the 1970s, Paul was one of three ichthyologists who doubled our knowledge of the region's fish fauna, along with Jack Randall who worked on shallow-water fishes and Thomas A. Clarke who studied midwater species. His collections also included invertebrates that were lodged in museum collections to be used for species descriptions and other publications (e.g., Manning and Struhsaker, 1976). Paul had a long-standing interest in flatfishes and their larvae, with a manuscript on those in Hawaii in preparation that he was unable to complete prior to his death. Illustrations from his work on Hawaii's flatfish larvae were published in Ahlstrom et al. (1984).

After departing from the NMFS Honolulu Laboratory, Paul was employed in 1981 as a scientific consultant for the Easy Rider Corporation in Honolulu, a company that fished for lobsters in the Northwestern Hawaiian Islands. He worked again at the NMFS Southeast Fisheries Center in 1981–1982. Paul moved to Quebec, Canada with his wife Rejeanne Courcelles in 1985 and was associated briefly with the NMFS Seattle, Juneau, and Woods Hole Laboratories in 1989–1991, sometimes working as observer on commercial fishing vessels. Paul later worked on gear modifications to reduce bycatch in the scallop fishery (Smolowitz et al., 2004) and of cetaceans in gillnets (Struhsaker, 1994). In addition to his research in ichthyology, in his later years Paul worked with his brother, Thomas Struhsaker, on the ecology and conservation of mammals in Africa (T. Struhsaker et al., 2005; Lwanga et al., 2011).

Aside from his professional achievements and pursuits, Paul had a wide range of interests. He was a prolific reader and a true intellect; you could discuss almost anything with him, especially with his incredible memory that he kept to the end of his life. Tom credits Paul with being one of his earliest mentors in terms of fostering his interests in biology, travel, and, eventually, his career. Paul loved music, art, literature, history, geography, geology, architecture, and cars. While in high school, he even considered becoming an architect. Still in high school, he once stripped a car down to its chassis and drove it around the neighborhood, minus a

body; no roof, no sides, no doors, no hood, only the front seat, steering wheel and column, gear shift, chassis, engine, and tires. He tried to sell it in that condition. Eventually, he put the car back together. Paul introduced Tom to a range of music, including rhythm and blues, classical (Tom still plays the CD that Paul sent of Bach's cello suites featuring both Pablo Casals and YoYo Ma), jazz (Miles Davis, Dave Brubeck), big band (Glenn Miller), Cuban (Ibrahim Ferrer and the Buena Vista Social Club), and the Gregorian Chants, to name a few. Until arthritis took over his hands, Paul was an excellent sketch artist, even doing drawings for scientific articles. In his later years, Paul made incredibly beautiful computer scans of flowers and, using a math program, created gorgeous abstract images. He was a good brother and friend, missed by all who knew him. Paul Struhsaker is survived by his wife Rejeanne Courcelles, sister Anne Larsen, and brothers Thomas and James Struhsaker.

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