

STATEMENT OF QUALIFICATIONS

Louis Worth Botsford

EDUCATION

B.S.	University of California, Berkeley, June 1967, Electrical Engineering
M.S.	University of California, Davis, March 1975, Electrical Engineering
Ph.D.	University of California, Davis, September 1978, Electrical Engineering. Dissertation title: Modeling, Stability and Optimization of Aquatic Productive Systems

EMPLOYMENT

July 1984- Present	Associate Professor, Department of Wildlife and Fisheries Biology, University of California, Davis
March 1980- June 1984	Assistant Professor, Department of Wildlife and Fisheries Biology, University of California, Davis
Spring 1979	Instructor, Wildlife and Fisheries Biology, University of California, Davis. (Course title: Dynamics of exploited animal populations)
1976-1980	Postgraduate Researcher, Bodega Marine Laboratory, Economic analysis of fisheries and aquaculture
1975-1976	Teaching Assistant, Department of Electrical Engineering, University of California, Davis
1968-1971	Research Engineer, Lockheed Research Laboratories, Palo Alto, California
1960-1962	Fish cannery laborer, A. Paladini Inc., Fort Bragg, California

PUBLICATIONS

- Hall, G. A., H. L. Gibbs, P. R. Grant, L. W. Botsford, and G. S. Bucher. 1987. Effects of ENSO on terrestrial birds. Proc. Int. Ornithol. Union (in press).
- Botsford, L. W., B. Vondracek, T. C. Wainwright, A. L. Linden, R. G. Kope, D. E. Reed, and J. J. Cech, Jr. 1987. Population development of the mosquitofish, Gambusia affinis in rice fields. Environmental Biology of Fishes (in press).
- Botsford, L. W. 1987. Analysis of environmental influences on population dynamics (in press).
- Botsford, L. W. 1986. Effects of environmental forcing on age-structured populations: northern California Dungeness crab as an example. Can. J. Fish. Aquat. Sci. 43:2345-2352.
- Hamilton, A., L. W. Botsford and J. R. Carey. 1986. Demographic examination of sex ratio in the two-spotted spider mite, Tetranychus urticae Koch. Entomologia Experimentalis et Applicata 41:147-151.
- Botsford, L. W. and R. C. Hobbs. 1986. Static optimization of yield per recruit with reproduction and fishing costs. Fisheries Research (in press).
- Johnson, D. F., L. W. Botsford, R. D. Methot, Jr., and T. C. Wainwright. 1986. Wind stress and cycles in Dungeness crab (Cancer magister) catch off California, Oregon and Washington. Can. J. Fish. Aquat. Sci. 43:838-845.
- Botsford, L. W. 1986. Population dynamics of the Dungeness crab (Cancer magister). pp. 140-153 In G. S. Jamieson and N. Bourne (Eds.) North Pacific Workshop on Stock Assessment and Management of Invertebrates. Can. Spec. Publ. Fish. Aquat. Sci. 92.
- Sykes, S. D. and L. W. Botsford. 1986. Chinook salmon (Oncorhynchus tshawytscha) spawning escapement based on multiple mark-recapture of carcasses. U.S. Fishery Bulletin 84:261-270.
- Botsford, L. W. 1985. Models of growth, pp. 171-188. In A. Wenner (Ed.) Crustacean Growth. A. Balkema Publishers, Rotterdam. 362 pp.
- Wainwright, T. C., R. G. Kope, L. W. Botsford, and J. J. Cech, Jr. 1985. Implications of laboratory mosquitofish experiments for population development in rice fields. Calif. Mosq. Vect. Contr. Assoc. 52:110-114.
- Botsford, L. W. and T. C. Wainwright. 1985. Optimal fishery policy: an equilibrium solution with irreversible investment. Journal of Mathematical Biology 21:317-320.
- Anderson, S. L., L. W. Botsford and W. H. Clark, Jr. 1985. Size distributions and sex ratios of ridgeback prawns (Sicyonia ingentis) in the Santa Barbara channel (1979-1981). Calif. Co-op Fish. Invest. Rep. XXVI:169-174.

Botsford, L. W. 1984. Comments on marine survival of Pacific salmonids. In W. G. Pearcy (Ed.) The Influence of Ocean Conditions on the Production of Salmonids in the North Pacific. Oregon State University, Corvallis. 327 pp.

Botsford, L. W. and R. Hobbs. 1984. Optimal fishery policy with artificial enhancement through stocking: California's white sturgeon as an example. Ecological Modelling 23:293-312.

Botsford, L. W. 1984. Effect of individual growth rates on expected behavior of the northern California Dungeness crab (Cancer magister) fishery. Can. J. Fish. Aquat. Sci. 41:99-107.

Allen P. G., L. W. Botsford, A. M. Schuur and W. E. Johnston. 1984. The Bioeconomics of Aquaculture, Elsevier, Amsterdam, The Netherlands. 351 pp.

Botsford, L. W. 1983. Age- and size-specific models in the Dungeness crab fishery, pp. 394-400. In H. F. Freedman, C. Strobeck (Eds.) Proceedings of the International Conference on Population Biology, Springer Verlag, New York.

Botsford, L. W., R. D. Methot and W. E. Johnson. 1983. Effort dynamics of the northern California Dungeness crab (Cancer magister) fishery. Can. J. Fish. Aquat. Sci. 40(3):337-346.

Botsford, L. W., R. D. Methot and J. E. Wilen. 1982. Cyclic covariation in the California king salmon (Oncorhynchus tshawytscha), silver salmon (O. kisutch) and Dungeness crab (Cancer magister) fisheries. Fish. Bull. U.S. 80(4):791-801.

Methot, R. D. and L. W. Botsford. 1982. Estimated pre-season abundance in the California Dungeness crab (Cancer magister) fisheries. Can. J. Fish. Aquat. Sci. 39:1077-1083

Botsford, L. W. 1981. Comment on cycles in the northern California Dungeness crab population. Can. J. Fish. Aquat. Sci. 38(10):1295-1296.

Botsford, L. W. 1981. Optimal fishery policy for size-specific, density-dependent population models. J. Math. Biol. 12:265-293.

Botsford, L. W. 1981. More realistic fishery models: cycles, collapse, and optimal policy, pp. 6-20. In T. L. Vincent and J. Skowronski (Eds.) Renewable Resource Management, Springer Verlag, New York.

Botsford, L. W. 1981. The effects of increased individual growth rates on depressed population equilibria. Am. Nat. 117(1):38-63.

Johnson, W. E. and L. W. Botsford. 1981. Systems analysis for lobster aquaculture. Proc. World Symp. on Aquaculture in Heated Effluents and Recirculation Systems. Stavanger, Norway. May 1980. Vol. II. Berlin.

Botsford, L. W. and D. E. Wickham. 1979. Population cycles caused by inter-age density-dependent mortality in young fish and crustaceans. In E. Naylor and R. G. Hartnoll, eds., Cyclic Phenomena in Marine Plants and Animals, Pergamon Press, pp. 73-82.

Botsford, L. W. and D. E. Wickham. 1978. The behavior of age-specific, density-dependent models and the northern California Dungeness crab fishery. *J. Fish. Res. Board Can.* 35:833-843.

Botsford, L. W. and T. W. Gossard. 1978. Implications of growth and metabolic rates on costs of aquaculture. *Proceedings of the Ninth Annual Workshop, World Mariculture Society* 9:413-423.

Botsford, L. W. 1977. Current economic status of lobster culture research. *Proceedings of the Eighth Annual Workshop, World Mariculture Society* 8:723-739.

Botsford, L. W., J. C. Van Olst, J. M. Carlberg and T. W. Gossard. 1977. The use of mathematical modeling and simulation to evaluate aquaculture as a beneficial use of thermal effluent. *Proceedings of the 1977 Summer Computer Simulation Conference*, pp. 405-410.

Botsford, L. W., H. E. Rauch, A. M. Schuur and R. A. Schleser. 1975. An economically optimum aquaculture facility. *Proceedings of the Sixth Annual Workshop, World Mariculture Society* 6:407-420.

Botsford, L. W. and D. E. Wickham. 1975. Correlation of upwelling index and Dungeness crab catch. *U.S. Fishery Bulletin* 73-4:901-907.

Rauch, H. E., L. W. Botsford and R. H. Schleser. 1975. Economic optimization of aquaculture facility. *IEEE Trans. on Automatic Control* AC-20(3):3100-3119.

Schuur, A. M., P. G. Allen and L. W. Botsford. 1975. An analysis of three facilities for the production of Homarus americanus. Winter meeting of the American Society of Agricultural Engineers.

Botsford, L. W., H. E. Rauch and R. A. Schleser. 1974. Application of optimization theory to the economics of aquaculture. *Proceedings of the Fifth Annual Workshop, World Mariculture Society* 5:387-401.

Rauch, H. E., L. W. Botsford and R. A. Schleser. 1974. The use of estimation theory to predict the growth of crabs and lobsters. *Proceedings of the 5th Annual Symposium on Non-linear Estimation Theory*, pp. 208-216.

Rauch, H. E. and L. W. Botsford. 1974. Applications of optimization theory to aquatic productive systems. Presented at AIAA Mechanics and Flight Control Conference, Anaheim, California.

Botsford, L. W., H. E. Rauch and R. A. Schleser. 1974. Optimal temperature control of a lobster plant. *IEEE Trans. on Automatic Control* AC-19 5:541-542.

INVITED PAPERS

Analysis of environmental influences on population dynamics. Presented at the Second Conference on Applications of Control Theory to Renewable Resources. Honolulu, Hawaii, December 1985.

Effects of environmental forcing on age-structured populations: northern California Dungeness crab as an example. Presented at the Lobster Recruitment Workshop. St. Andrews, New Brunswick, July 1985.

Population dynamics of Dungeness crab. Presented at the North Pacific Workshop on Recent Advances in Stock Assessment and Management of Invertebrates. Nanaimo, B.C., Canada. May 1984.

Models of crustacean growth. Presented at the 1982 meeting of the American Zoological Society. Louisville, Kentucky. December 1982.

The effects of environmental variability on California Dungeness crab and salmon catch. Presented at the annual meeting of the American Fisheries Society. Albuquerque, New Mexico. September 1981.

Optimal fishery policy for size-specific, density-dependent population models. Presented at the joint annual meeting of the Biometric Society (WNAR) and the Institute of Mathematical Statistics (WR). Victoria, British Columbia. June 1981.

Size-specific fishery models: cycles, collapse and optimal theory. Presented at the Workshop on Applied Control to Renewable Resource Management and Ecology. Christchurch, New Zealand. January 1980.

SELECTED PROFESSIONAL PAPERS PRESENTED

Static optimization of yield per recruit with reproduction and fishing costs. Presented at the Pacific Coast Conference on Mathematical Modelling of Renewable Resources. San Luis Obispo, California, May 1985.

Influence of oceanographic conditions on California chinook salmon. Presented at the Ocean Sciences Meeting of the American Geophysical Union, New Orleans, Louisiana. January 1984.

Population dynamics of mosquitofish in California ricefields. Presented at the Annual Meeting of the California Mosquito and Vector Control Association. February 1983.

Age- and size-specific models in the Dungeness crab fishery. Presented at the International Conference on Population Biology. Edmonton, Alberta. June 1982.

Cycles in the northern California Dungeness crab population. Presented at the Pacific Coast Conference on Mathematical Modelling of Renewable Resources. Arcata, California. April 1982.

Population cycles caused by inter-age, density-dependent mortality in young fish and crustaceans. Presented at the 13th European Marine Biology Symposium. Isle of Man. September 1978.

Implications of growth and metabolic rates on costs of aquaculture. Presented at the Ninth Annual Workshop of the World Mariculture Society. Atlanta, Georgia. January 1978.

The current economic status of lobster culture research. Presented at the Eighth Annual Workshop of the World Mariculture Society. San Jose, Costa Rica. January 1977.

An economically optimum aquaculture facility. Presented at the Sixth Annual Workshop of the World Mariculture Society. Seattle, Washington. January 1975.

Economic optimization of an aquaculture facility. Presented at the 1974 Joint Automatic Control Conference. Austin, Texas. June, 1974.

Application of optimization theory to the economics of aquaculture. Presented at the 5th Annual Workshop of the World Mariculture Society. Charleston, South Carolina. January 1974.

SOCIETY MEMBERSHIPS

Phi Kappa Phi

American Association for the Advancement of Science

Sigma Xi

Ecological Society of America

American Fisheries Society (Fishery Educators Section, Marine Fisheries Section)

World Mariculture Society

Bodega Marine Sciences Association