

U.S. Fish & Wildlife Service

# Technical Publications of the U.S. Fish and Wildlife Service Fish Technology Centers

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# Foreword

This publication presents a comprehensive listing of reference materials from the U.S. Fish and Wildlife Service Division of National Fish Hatchery System's Fish Technology Centers. The list contains published articles, station leaflets, and other publications produced by the Centers from 1966 to 2000. References that resulted from collaborative efforts among Technology Centers are listed and grouped under each Center. Copies of the individual articles may be obtained by writing the Director of the appropriate facility. A list of addresses is provided at the back of this publication.

Technology transfer is one of the primary missions of all Centers. This list represents an important component of technology transfer: that of making research information available to the public, thereby ensuring the most current science and technology concerning fishery management and culture is available for use. In this manner the Fish Technology Center system can better serve the fishery resource needs of the American public.

The Fish Technology Center publication list may also be accessed on the internet (<http://fisheries.fws.gov/FTC/FTCPub.htm>), where it is regularly updated.

# Background

## *Fish Technology Center Overview*

Fish Technology Centers were established to provide leadership and guidance to the fish culture community. Over the years, fish culture studies focused on reducing costs, enhancing fish quality, and improving overall fish culture operations. The importance of Fish Technology Centers became clear as fishery managers were increasingly aware of the need to produce fish that are healthy, genetically diverse, and well-adapted to fishery management objectives.

Correspondingly, Fish Technology Center roles and responsibilities have grown, and areas of specialty have expanded to include technical support to fishery resource programs such as inter-jurisdictional fishes, estuarine and riverine fishes, non-indigenous aquatic nuisance species, threatened and endangered

species, and other high priority aquatic resource issues. To accomplish their work, each Fish Technology Center now maintains at least two areas of technical expertise. Functioning as a cohesive system, each Fish Technology Center strengthens the others, taking full advantage of various geographic differences to ensure that study results will successfully support a broad range of users. Through their partnership role with other Service programs and federal agencies, States, tribes, the private sector and international cooperation, Fish Technology Centers provide a vital link in the Service's commitment to conservation of our Nation's aquatic resources.

# Abernathy Fish Technology Center Publication List

## Peer Reviewed Publications

- Burger, C. V., K. T. Schribner, W. J. Spearman, C. O. Swanton, and D. E. Campton. In press. Genetic contribution of three introduced life history forms of sockeye salmon to colonization of Frazer Lake, Alaska. *Canadian Journal of Fisheries and Aquatic Sciences* 57(10).
- Gannam, A. L., and R. M. Schrock. 2000. Immunostimulants in fish diets. In C. Limm and C. D. Webster, eds. *Nutrition and Fish Health*. The Haworth Press, New York.
- Pirhonen, J., C. B. Schreck, and A. L. Gannam. 2000. Appetite of chinook salmon (*Oncorhynchus tshawytscha*) naturally infected with bacterial kidney. *Aquaculture* 189:1\_10.
- Webster, C. D., L. J. Tiu, A. M. Morgan, and A. L. Gannam. 2000. Differences in growth in blue catfish *Ictalurus furcatus* and *I. punctatus* fed low protein diets with and without supplemental methionine and/or lysine. *Journal of the World Aquaculture Society* 31(2):195\_205.
- Webster, C. D., K. R. Thompson, A. M. Morgan, E. J. Grisby, and A. L. Gannam. 2000. Use of hempseed meal, poultry by-product meal, and canola meal in practical diets without fish meal for sunshine bass (*Morone chrysops* x *M. saxatilis*). *Aquaculture* 188:299\_309.
- Burger, C. V. 1999. The needs of salmon and steelhead in balancing their conservation and use. Pages 15\_30 in E. E. Knudsen, C. R. Steward, D. D. MacDonald, J. E. Williams, and D. W. Reiser, eds. *Sustainable Fisheries Management: Pacific Salmon*. Lewis Publishers, CRC Press LLC, Boca Raton, FL.
- Gannam, A. L., and R. M. Schrock. 1999. Immunostimulants in fish diets. *Journal of Applied Aquaculture* 9(4):53\_89.
- Webster, C. D., L. J. Tiu, A. M. Morgan, and A. L. Gannam. 1999. Effect of partial and total replacement of fish meal on growth and body composition of sunshine bass *Morone chrysops* x *M. saxatilis* fed practical diets. *Journal of the World Aquaculture Society* 30(4):443\_453.
- Taylor, P. W., and S. D. Roberts. 1999. Clove oil: an alternative anaesthetic for aquaculture. *North American Journal of Aquaculture* 61:150\_155.
- Campton, D. E. 1998. Pikefish, not pikeminnow. *Fisheries* 23(11):38.
- Rossi, A. R., M. Capula, D. Crosetti, L. Sola, and D. E. Campton. 1998. Allozyme variation in global populations of striped mullet, *Mugil cephalus* (Pisces: mugilidae). *Marine Biology* 131:203-212.
- Rossi, A. R., M. Capula, D. Crosetti, L. Sola, and D. E. Campton. 1998. Genetic divergence and phylogenetic inferences in five species of Mugilidae (Pisces: Perciformes). *Marine Biology* 131:213-218.
- Burger, C. V., W. J. Spearman, and M. A. Cronin. 1997. Genetic differentiation of sockeye salmon subpopulations from a geologically young lake system. *Transactions of the American Fisheries Society* 126:926-938.
- Finn, J. E., C.V. Burger, and L. Holland-Bartels. 1997. Discrimination among populations of sockeye salmon fry with Fourier analysis of otolith banding patterns formed during incubation. *Transactions of the American Fisheries Society* 126:559-578.
- Waterstrat, P. R. 1997. Distribution and abundance of *Saprolegnia* in the water supply of a Columbia River salmon hatchery. *Journal of Aquatic Animal Health* 9:58-63.
- Campton, D. E. 1995. Genetic effects of hatchery fish on wild populations of Pacific salmon and steelhead: what do we really know? *American Fisheries Society Symposium* 15:337-353.
- Waterstrat, P. R., and L. L. Marking. 1995. Clinical evaluation of formalin, hydrogen peroxide, and sodium chloride for the treatment of *Saprolegnia parasitica* on fall chinook salmon eggs. *The Progressive Fish-Culturist* 57:287\_91.
- Waterstrat, P. R., and L. L. Marking. 1995. Clinical evaluation of formalin, hydrogen peroxide and salt for the control of *Saprolegnia* in fall chinook salmon eggs. *The Progressive Fish-Culturist* 57:287-291.
- Banks, J. L. 1994. Raceway density and water flow as factors affecting spring chinook salmon during rearing and after release. *Aquaculture* 119:201-217.
- Banks, J. L. 1992. Effect of density and loading on coho salmon during hatchery rearing and after release. *The Progressive Fish-Culturist* 54(3):137-147
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- Fowler, L. G., and J. L. Banks. 1991. A safe level of iodophor for treating eggs of fall chinook salmon during water-hardening. *The Progressive Fish-Culturist* 53 (4):250-251.

- Fowler, L. G., and J. L. Banks. 1990. Iodophor toxicity to eggs and fry of fall chinook salmon. *The Progressive Fish-Culturist* 52(3):176-178.
- Fowler, L. G. 1990. Feather meal as a dietary protein source during parr-smolt transformation in fall chinook salmon. *Aquaculture* 89:301-314.
- Marking, L. L., D. Leith, and J. Davis. 1990. Development of a carbon filter system for removing malachite green from hatchery effluents. *The Progressive Fish-Culturist* 52(2):92-99.
- Barton, B. A., C. B. Schreck, and L. G. Fowler. 1988. Fasting and diet content affect stress-induced changes in plasma glucose and cortisol in juvenile chinook salmon. *The Progressive Fish-Culturist* 50(1):16-22.
- Morrison, J., and D. Zajac. 1987. Histologic effect of coded wire tagging in chum salmon. *North American Journal of Fisheries Management* 7:439-441.
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- Corey, P. D., D. A. Leith, and M. J. English. 1983. A growth model for coho salmon including effects of varying ration allotments and temperature. *Aquaculture* 30:125-143.
- Fowler, L. G. 1983. Effect of dietary protein and energy on growth and survival of fall chinook salmon fry. *The Progressive Fish-Culturist* 45(2):128-129.
- Piper, R. G., I. B. McElwain, L. E. Orme, J. P. McCraren, L. G. Fowler, and J. R. Leonard. 1982. *Fish Hatchery Management*. U.S. Department of the Interior, Fish and Wildlife Service, Washington D.C. 517 pp.
- Schreck, C. B., and L. G. Fowler. 1982. Growth and reproductive development in fall chinook salmon: effects of sex hormones and their antagonists. *Aquaculture* 26:253-263.
- Fowler, L. G. 1981. Protein and energy relation of starting diets for chinook salmon fry. *The Progressive Fish-Culturist* 43(3): 151-152.
- Fowler, L. G. 1980. Substitution of soybean and cottonseed products for fish meal in diets fed to chinook and coho salmon. *The Progressive Fish-Culturist* 42(2):87-91.
- Fowler, L. G. 1980. Starting diets for chinook salmon fry. *The Progressive Fish-Culturist* 42(3):165-166.
- Lagasse, J. P., D. A. Leith, D. B. Romney, and O. F. Dahrens. 1980. Stamina and survival of coho salmon reared in rectangular circulating ponds and conventional raceways. *The Progressive Fish-Culturist* 42(3):153-156.
- Fowler, L. G., and J. L. Banks. 1976. Animal and vegetable substitutes for fish meal in the Abernathy diet, 1973. *The Progressive Fish-Culturist* 38(3):123-126.
- Fowler, L. G., and J. L. Banks. 1976. Fish meal and wheat germ meal substitutes in the Abernathy diet, 1974. *The Progressive Fish-Culturist* 38(3):127-130.
- Fowler, L. G. 1973. Tests of three vitamin supplementation levels in the Abernathy diet. *The Progressive Fish-Culturist* 35(4):197-198.
- Fowler, L. 1972. Growth and mortality of fingerling chinook salmon as affected by egg size. *The Progressive Fish-Culturist* 34(2):66-69.
- Banks, J., L. Fowler, and J. Elliott. 1971. Effects of rearing temperature on growth, body form, and hematology of fall chinook fingerlings. *The Progressive Fish-Culturist* 33(1):20-26.
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Gannam, A. L., P. R. Waterstrat, R. J. Pascho, and C. L. McKibben. In Preparation. An evaluation of feather meal as a feed ingredient and immuno-modulator for fall chinook salmon (*Oncorhynchus tshawytscha*). Intended Outlet: North American Journal of Aquatic Animal Health.

**Technology Center  
Transfer Series; 1980-1990**

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Fowler, L. G. 1989. Feeds and feeding practices for improved fish health. Technology Transfer Series, No. 88-1, AFF/ATC-89-04 :33 pp.

Banks, J. L., and L. G. Fowler. 1988. Effect of accelerated rearing on adult survival of spring chinook salmon. Technology Transfer Series, No. 87-1. FR1/ATC-88-06:12 pp.

Fowler, L. G., J. L. Banks, J. D. McIntyre, and C. B. Schreck. 1988. Selective breeding of Abernathy fall chinook: Experimental design and hatchery performance of 1973-1977 broods. Technology Transfer Series, No. 86-1 — FR1/ATC -88-05:31 pp.

Fowler, L. G. 1986. Tests with blood meal, shrimp meal, and condensed fish solubles as components of fall chinook salmon diets. Technology Transfer Series, No. 85-1:16 pp.

Anderson, A. R. 1985. Effects of therapeutic disease treatments on nitrification in model water recycle systems: A preliminary study. Technology Transfer Series, No. 84\_1: 56 pp.

Banks, J. L. 1983. Artificial substrate in vertical incubators: A method for controlling coagulated yolk disease in chinook salmon, *Oncorhynchus tshawytscha* (Walbaum). Technology Transfer Series, No. 83\_1: 17 pp.

Banks, J. L., and L. G. Fowler. 1982. The effects of population weight loads and crowding on fall chinook fingerlings reared in circular tanks. Technology Transfer Series, No. 82\_3: 12 pp.

Anderson, A. R. 1982. The use of ozone in fish culture: A brief review. Technology Transfer Series, No. 82\_2: 32 pp.

Banks, J. L., and L. G. Fowler. 1982. Transportation, storage, and handling studies of fall chinook salmon gametes and newly fertilized eggs. Technology Transfer Series, No. 82\_4: 18 pp.

Fowler, L. G. 1982. 1981 Tests with poultry by-product meal in fall chinook salmon diets. Technology Transfer Series, No. 82-1:13 pp.

Fowler, L. G. 1981. Effects of lipid and amino acid supplementation in chinook salmon diets containing poultry by-product meal. Technology Transfer Series, No. 81-3. 12 pp.

Fowler, L. G. 1981. Evaluation of fish oils, condensed fish solubles, single cell protein, and additional minerals in fall chinook salmon diets. Technology Transfer Series, No. 81-4. 13 pp.

Fowler, L. G. 1981. Tests of vegetable protein replacements and alternate ingredients in the Abernathy diet. Technology Transfer Series, No. 81-1. 14 pp.

Fowler, L. G., and J. L. Banks. 1981. Delayed fertilization of fall chinook salmon eggs: A preliminary report. Technology Transfer Series, No. 81-2. 6 pp.

Fowler, L. G. 1980. Feeding trials with fall chinook salmon evaluating fish meals, fish oils, oat groats, and skretting diet. Technology Transfer Series, No. 80-5. 11 pp.

Fowler, L. G., and J. L. Banks. 1980. Survival rates of three sizes of hatchery-reared fall chinook salmon. Technical Transfer Series, No. 80-1. 12 pp.

Fowler, L. G., R. E. Burrows, B. D. Combs, and A. E. Thomas. 1980. The effect of improved rearing conditions on the adult survival of fall chinook salmon. Technology Transfer Series, No. 80-2. 12 pp.

Fowler, L. G., R. E. Burrows, B. D. Combs, and J. L. Banks. 1980. The effect of size and time of release of fall chinook salmon fingerlings on adult survival. Technology Transfer Series, No. 80-3. 13 pp.

Fowler, L. G., R. E. Burrows, B. D. Combs, and J. L. Banks. 1980. Effect of two rearing environments on the survival of adult fall chinook salmon. Technology Transfer Series, No. 80-4. 12 pp.

**Miscellaneous Reports**

- Fowler, L. G., and E. LaMotte. 1990. Further seawater challenge tests at Spring Creek National Fish Hatchery: 1990. Abernathy Salmon Culture Technology Center. Processed Report. 13 pp.
- Fowler, L. G., E. H. Pelton, and T. A. Neilsen. 1990. A seawater challenge test on fish infected with erythrocytic inclusion body syndrome (EIBS). Abernathy Salmon Culture Technology Center. Processed Report. 5 pp.
- Fowler, L. G., E. LaMotte, and E. Gunderson. 1989. Seawater challenge tests at Spring Creek National Fish Hatchery during 1989. Processed Report. 10 pp.
- Leith, D., J. Holmes, and S. Kaattari. 1989. Effects of vitamin nutrition on the immune response of hatchery reared salmonids. Final Report to the Bonneville Power Administration, Agreement No.: DE-A179-84BP18010 and DE-A179-84BP18007: 94 pp.
- Leith, D., M. Newman, S. Kaattari, N. Holland, and J. Dekoning. 1987. Effects of vitamin nutrition on the immune response of hatchery-reared salmonids. Annual Report to the Bonneville Power Administration, Agreement No.: DE-A179-84BP18010 and DE-A-179-84BP18007: 75 pp.
- Leith, D., J. Holmes, S. Kaattari, and M. Yui. 1986. Effects of vitamin nutrition on the immune response of hatchery-reared salmonids. Annual Report to the Bonneville Power Administration, Agreement No. DE-A179-84BP18007: 66 pp.
- Leith, D., J. Holmes, S. Kaattari, M. Yui, and T. Jones. 1985. Effects of vitamin nutrition on the immune response of hatchery reared salmonids. Annual Report to the Bonneville Power Administration, Agreement No. DE-A179-84BP18007: 66 pp.
- Anderson, A. R. 1983. Effects of water quality on coagulated yolk syndrome incidence. Abernathy Salmon Culture Technology Center Processed Report. 23 pp.
- Fowler, L. G. 1983. Use of a single cell protein product in fall chinook salmon diets. Processed Report: 7 pp.
- Fuze, D. M., G. Kindschi, and J. L. Banks. 1981. Notes on the formalin treatment of fall chinook salmon eggs for fungus, *Saprolegnia* sp. Mimeo. 5 pp.
- Banks, J. L., W. G. Taylor, and S. L. Leek. 1979. Carrying capacity recommendations for Olympia area National Fish Hatcheries. Processed Report. 57 pp.
- Banks, J. L. 1977. A review of whitespot and coagulated yolk disease investigations at lower Columbia River hatcheries, 1954-1976 and proposals for future studies. Processed Report, 20 pp.
- Fowler, L. G., and J. L. Banks. 1975. Accelerated rearing of steelhead trout. Mimeo. 1 pp.
- Fowler, L. G., and J. L. Banks. 1975. Dry diets for spring chinook salmon. Mimeo. 6 pp.
- Shanks, W. E. 1975. Tests of efficiency of changes in filter media and filter design unit: experiments with polystyrene bead media. Mimeo Report. 5 pp.
- Shanks, W. E., and B. D. Combs. 1975. Tests of efficiency of changes in filter media and filter design-unit: trickling filter — expanded shale media. Mimeo. 4 pp.
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- Banks, J. L., L. G. Fowler, and W. Booker. 1974. Effects of four feeding levels and four loading levels on growth and conversion efficiency of coho fingerlings in constant 53EF. Mimeo. 3 pp.
- Fowler, L. G., and J. L. Banks. 1974. Accelerated rearing of steelhead trout. Mimeo. 1 pp.
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- Fowler, L. G., and J. L. Banks. 1972. Accelerated rearing of steelhead trout. Mimeo. 2 pp.
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Thomas, A. E., and J. M. Shelton. 1968. Operation of Abernathy channel for incubation of salmon eggs. U.S. Fish & Wildlife Service Technical Paper 23. 19 pp.

Fowler, L. G., and J. L. Banks. 1967. Test of different components in the Abernathy salmon diet. U.S. Fish & Wildlife Service Technical Paper 13. 18 pp.

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Fowler, L. G., H. McCormick, Jr., and A. E. Thomas. 1966. Studies of caloric and vitamin levels of salmon diets. U.S. Fish & Wildlife Service Technical Paper 6. 14 pp.

Burrows, R. 1964. Effects of accumulated excretory products on hatchery-reared salmonids. U.S. Fish & Wildlife Service Research Report 66. 12 pp.

# Bozeman Fish Technology Center Publication List

## Peer Reviewed Publications

- Lellis, W. A. and F. T. Barrows. 2000. Effect of dietary ingredient substitution on dorsal fin erosion of steelhead. *North American Journal of Aquaculture*, 62:135-138.
- Farag, A. M., M. J. Suedkamp, J. S. Meyer, R. Barrows, and D. F. Woodward. 2000. Distribution of metals during digestion by cutthroat trout fed benthic invertebrates contaminated in the Clark Fork River, Montana and the Coeur d'Alene River, Idaho, U.S.A., and fed artificially contaminated *Artemia*. *Journal of Fish Biology*, 56:173-190.
- Barrows, F. T. 2000. Feed Additives, pages 335-340 In: R. R. Stickney, ed., *Encyclopedia of Aquaculture*. John Wiley and Sons, Inc. New York
- Barrows, F. T., and R. W. Hardy. 2000. Feed Manufacturing Technology, pages 354-360 In: R. R. Stickney, ed. *Encyclopedia of Aquaculture*. John Wiley and Sons, Inc. New York.
- Barrows, F. T., and M. B. Rust. 2000. Larval Feeding — Fish, pages 465-469 In: R. R. Stickney, ed., *Encyclopedia of Aquaculture*. John Wiley and Sons, Inc. New York
- Barrows, F. T., and W. A. Lellis. 2000. Microbound Feeds, pages 525-528. In: R. R. Stickney, ed., *Encyclopedia of Aquaculture*. John Wiley and Sons, Inc. New York
- Barrows, F. T. 2000. Larval feeds: Two methods for production of on-size, microbound particles. *Global Aquaculture Advocate*, 3:61,63.
- Barrows, F.T., and W. A. Lellis. 1999. The effect of dietary protein and lipid source on dorsal fin erosion in rainbow trout, *Oncorhynchus mykiss*. *Aquaculture* 180:167-175.
- Tidwell, J. H., C. D. Webster, S. D. Coyle, and F. T. Barrows. 1999. Growth of juvenile walleye, *Stizostedion vitreum*, fed two dietary protein levels in ponds. *Journal of Applied Aquaculture* 9:47-56.
- Bardi, Jr., R. W., F. A. Chapman, and F. T. Barrows. 1998. Feeding trials with hatchery-produced Gulf of Mexico sturgeon larvae. *The Progressive Fish-Culturist* 60:25-31.
- Skonberg, D. I., R. W. Hardy, F. T. Barrows, and F. M. Dong. 1998. Color and flavor analyses of fillets from farm-raised rainbow trout (*Oncorhynchus mykiss*) fed low-phosphorus feeds containing corn or wheat gluten. *Aquaculture* 166:269-277.
- Andree, K. B., E. MacConnell, R. P. Hedrick. 1998. A nested polymerase chain reaction for the detection of genomic DNA of *Myxobolus cerebralis* in rainbow trout *Oncorhynchus mykiss*. *Diseases of Aquatic Organisms* 34:145-154.
- Bowker, J., and D. Erdahl. 1998. Observations on the efficacy of chloramine-T treatment to control mortality in a variety of salmonids. *The Progressive Fish-Culturist* 60:63-66.
- Hedrick, R. P., M. El-Matbouli, M. A. Adkinson, and E. MacConnell. 1998. Whirling Disease: re-emergence among wild trout. *Immunological Reviews* 166:365-376.
- Winfrey, R. A., G. A. Kindschi, and H. T. Shaw. 1998. Elevated water temperature, crowding, and food deprivation accelerate fin erosion in juvenile steelhead trout. *The Progressive Fish-Culturist* 60:192-199.
- Coyle, S. D., J. H. Tidwell, and F. T. Barrows. 1997. Preliminary studies on walleye feed training in cages and second-year growth in ponds. *The Progressive Fish-Culturist* 59:249-252.
- Barton, B. A., and W. P. Dwyer. 1997. Physiological stress effects of continuous-and pulsed-DC electroshock on juvenile bull trout to electroshock. *Journal of Fish Biology* 51:998-1008.
- Santerre, C. R., V. S. Blazer, N. Khanna, R. E. Reinert, and F. T. Barrows. 1997. Absorption of dietary dieldrin by striped bass. *Bulletin of Environmental Contamination and Toxicology* 58:334-340.
- Lellis, W. A., and F. T. Barrows. 1997. The effect of diet on dorsal fin erosion in steelhead trout, *Oncorhynchus mykiss*. *Aquaculture* 156:229-240.
- Dwyer, W. P., and R. G. White. 1997. Effect of electroshock on juvenile Arctic grayling and Yellowstone cutthroat trout growth, 100 days after treatment. *North American Journal of Fisheries Management* 17:174-177.
- Allard, L. W. 1997. Tribal fish and wildlife code assessment. *Intermountain Journal of Sciences* 3(2/3):107-115.
- Dwyer, W. P., R. Spoon, and D. Yerk. 1997. Effect of electroshock voltage and waveform on mortality of walleye eggs. *Intermountain Journal of Sciences* 3:8-11.
- Dick, T. A., and F. T. Barrows. 1996. Lake sturgeon: A freshwater fish species with a future. *Bulletin of Aquaculture Association of Canada* 3:50-52.

- Lohr, S. C., P. A. Byorth, C. M. Caya, and W. P. Dwyer. 1996. High-temperature tolerances of fluvial Arctic grayling and comparisons with summer river temperatures of the Big Hole River, Montana. *Transactions of the American Fisheries Society* 125:933-939.
- Barrows, F. T., and W. A. Lellis. 1996. Diet and nutrition. Walleye Culture Manual, R. C. Summerfelt, editor. Pages 315-321. *In* NCRAC Culture Series 101, North Central Regional Aquaculture Center Publications Office, Iowa State University, Ames, Iowa.
- Ashraf, M., K. L. Simpson, D. A. Bengtson, F. T. Barrows, and P. C. Maugle. 1996. Effect of dietary ascorbic acid vitamin supplements on growth and survival of striped bass, *Marone saxatilis*, and inland silverside, *Menidia beryllina*, larvae. *Pakistan Journal of Zoology* 28(3):185-189.
- Barton, B. A., and R. E. Zitzow. 1995. Physiological responses of juvenile walleyes to handling stress with recovery in saline water. *The Progressive Fish-Culturist* 57:267-276.
- Dwyer, W. P., and R. G. White. 1995. Influence of electroshock on short-term growth of adult rainbow trout and juvenile Arctic grayling and cutthroat trout. *North American Journal of Fisheries Management* 15(1):148-151.
- Dimes, L. E., N. F. Haard, F. M. Dong, B. A. Rasco, I. P. Forster, W. T. Fairgrieve, R. Arndt, R. W. Hardy, F. T. Barrows, and D. A. Higgs. 1994. Estimation of protein digestibility-II: *In vitro* assay of protein in salmonid feeds. *Comparative Biochemistry and Physiology* 108A(2/3):363-370.
- Kindschi, G. A., and R. F. Koby, Jr. 1994. Performance and oxygen consumption of Snake River cutthroat trout reared at four densities with supplemental oxygen. *The Progressive Fish-Culturist* 56:13-18.
- Dwyer, W. P., C. E. Smith, and B. D. Rosenlund. 1994. Recovery of the greenback cutthroat trout, a success story. *Proceedings Wild Trout V: Wild trout in the 21st century*, Yellowstone National Park.
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**Publications of the Beulah Fish Technology Center (1976–1987)**

The Beulah, Wyoming Fish Technology Center was closed in 1985 and all personnel, program responsibilities, and property assigned to the Bozeman Fish Technology Center. For copies of the following publications please contact the Bozeman Fish Technology Center Director.

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# Dexter Fish Technology Center Publication List

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- Tiersch, T. R., W. R. Wayman, J. H. Williamson, O. T. Gorman, G. J. Carmichael, and C. R. Figiel, Jr. In Press. Cryopreservation of sperm of endangered Colorado squawfish. *Cryobiology*.
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- Minckley, W. L., P. C. Marsh, J. E. Brooks, J. E. Johnson, and B. L. Jensen. 1991. Management toward recovery of the razorback sucker. Pages 303-357. *In* Battle Against Extinction — Native Fish Management in the American West, W. L. Minckley, and James E. Deacon, Editors. The University of Arizona Press, Tucson.
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- Minckley, W. L. 1985. Evaluations and suggestions concerning personnel, facilities, and programs at Dexter National Fish Hatchery. Report for the U.S. Fish and Wildlife Service. 15 pp.
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# Lamar Fish Technology Center Publication List

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