

Electrofishing Effects on Fish References

- Ainslie, B. J., J. R. Post, and A. J. Paul. 1998. Effects of pulsed and continuous DC electrofishing on juvenile rainbow trout. *North American Journal of Fisheries Management* 18:905–918.
- Bardygula-Nonn, L.G., R. Nonn, and J. Savitz. 1995. Influence of Pulsed Direct Current Electrofishing on Mortality and Injuries among Four Centrarchid Species. *North American Journal of Fisheries Management* 15:799-803.
- Barnes, M.E., J.P. Lott, W.A. Saylor, and R.J. Cordes. 1999. Practical Observations on the Use of Eggs from Electroshocked Females during Spawning of Inland Fall Chinook Salmon. *North American Journal of Aquaculture* 61: 162-166.
- Barrett, J. C., and G. D. Grossman. 1988. Effects of direct current electrofishing on the mottled sculpin. *North American Journal of Fisheries Management* 8:112–116.
- Barton, B. A., and R. S. Grosh. 1996. Effect of AC electroshock on blood features in juvenile rainbow trout. *Journal of Fish Biology* 49:1330–1333.
- Barton, B. A., and W. P. Dwyer. 1997. Physiological effects of continuous and pulsed-DC electroshock on juvenile bull trout. *Journal of Fish Biology* 51: 998–1008.
- Bird, D. J., and I. G. Cowx. 1993. The selection of suitable pulsed currents for electric fishing in fresh waters. *Fisheries Research* 18:363–376.
- Bohl, R.J., T.B. Henry, R. J. Strange, and P.L. Rakes. 2009. Effects of Electroshock on Cyprinid Embryos: Implications for Threatened and Endangered Fishes. *Transactions of the American Fisheries Society* 138:768-776.
- Bracewell, P., I.G. Cowx, and R.F. Uglow. 2003. Effects of handling and electrofishing on plasma glucose and whole blood lactate of *Leuciscus cephalus*. *Journal of Fish Biology* 64:65–71.
- Carline, R. F. 2001. Effects of high-frequency pulsed-DC electrofishing on a wild brown trout population. *North American Journal of Fisheries Management* 21:571–579.
- Cho, G. K., J. W. Heath, and D. D. Heath. 2002. Electroshocking influences chinook salmon egg survival and juvenile physiology and immunology. *Transactions of the American Fisheries Society* 131:224–233.
- Collins, G. B., C. D. Volz, and P. S. Trefethen. 1954. Mortality of salmon fingerlings exposed to pulsating direct current. *U.S. Fish and Wildlife Service Fishery Bulletin* 56:61–81.

- Cooke, S. J., C. M. Bunt, and R. S. McKinley. 1998. Injury and short term mortality of benthic stream fishes-a comparison of collection techniques. *Hydrobiologia* 379:207–211.
- Cowdell, B.R. and R.A. Valdez. 1994. Effects of Pulsed DC Electroshock on Adult Roundtail Chub from the Colorado River in Colorado. *North American Journal of Fisheries Management* 14: 659-660.
- Cowx, I.G. (ed.). 1990. Developments in electric fishing. Proceedings of an International Symposium on Fishing with Electricity, Hull, UK, 1988. Fishing News Books, Blackwell Scientific Publications, Oxford, U.K.
- Dalbey, S. R., T. E. McMahon, and W. Fredenberg. 1996. Effect of electrofishing pulse shape and electrofishing-induced spinal injury on long-term growth and survival of wild rainbow trout. *North American Journal of Fisheries Management* 16:560–569.
- Dolan, C.R., L.E. Miranda, and T. B. Henry. 2002. Electrofishing for Crappies: Electrical Settings Influence Immobilization Efficiency, Injury, and Mortality. *North American Journal of Fisheries Management* 22: 1442-1451.
- Dolan, C.R. and L.E. Miranda. 2004. Injury and Mortality of Warmwater Fishes Immobilized by Electrofishing. *North American Journal of Fisheries Management* 24:118-127.
- Dwyer, W. P., W. Fredenberg, and D. A. Erdahl. 1993. Influence of electroshock and mechanical shock on survival of trout eggs. *North American Journal of Fisheries Management* 13:839–843.
- Dwyer, W. P., and D. A. Erdahl. 1995. Effects of electroshock voltage, wave form, and pulse rate on survival of cutthroat trout eggs. *North American Journal of Fisheries Management* 15:647–650.
- 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* 15:148–151.
- 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.
- Dwyer, W. P., B. B. Shepard, and R. G. White. 2001. Effect of backpack electroshock on westslope cutthroat trout injury and growth 110 and 250 days posttreatment. *North American Journal of Fisheries Management* 21:646–650.
- Elliott, J .M., Andt, B., and Bagnenal. 1972. The effects of electrofishing on the invertebrates of a Lake District stream. *Oecologia (Berlin)* 9:1-11.

- Fowles, C. R. 1975. Effects of electricfishing on the invertebrate fauna of a New Zealand stream. *New Zealand Journal of Marine and Freshwater Research* 9:35-43.
- Gaikowski, M.P., W.H. Gingerich, and S. Gutreuter. 2001. Short-Duration Electrical Immobilization of Lake Trout. *North American Journal of Fisheries Management* 21:381-392.
- Gatz, A. J., Jr., J. M. Loar, and G. F. Cada. 1986. Effects of repeated electroshocking on instantaneous growth of trout. *North American Journal of Fisheries Management* 6:176-182.
- Gatz, A. J., Jr., and S. M. Adams. 1987. Effects of repeated electroshocking on growth of bluegill x green sunfish hybrids. *North American Journal of Fisheries Management* 7:448-450.
- Gatz, A. J., Jr., and R.S. Linder. 2008. Effects of Repeated Electroshocking on Condition, Growth, and Movement of Selected Warmwater Stream Fishes. *North American Journal of Fisheries Management* 28: 792-798.
- Grizzle, J.M., T.B. Henry, and I. Altinok. 2003. Lack of Effect of Electroshock on the Susceptibility of Rainbow Trout to Enteric Redmouth Disease. *Journal of Aquatic Animal Health* 15: 87-91.
- Habera, J. W., R. J. Strange, B. Carter, and S. E. Moore. 1996. Short-term mortality and injury of rainbow trout caused by three-pass AC electrofishing in a southern Appalachian stream. *North American Journal of Fisheries Management* 16:192-200.
- Habera, J.W., R.J. Strange, and A.M. Saxton. 1999. AC Electrofishing Injury of Large Brown Trout in Low-Conductivity Streams. *North American Journal of Fisheries Management* 19:120-126.
- Halsband, E. 1959. The effect of pulsating direct current on fish. Pages 575-580 in H. Kristjonsson, editor. *Modern fishing gear of the world: 1*. Fishing News Books, London.
- Hastie, L. C., and P. J. Boon. 2001. Does electrofishing harm freshwater pearl mussels? *Aquatic Conservation: Marine and Freshwater Ecosystems* 11:149-152.
- Hauck, F. R. 1949. Some harmful effects of the electric shocker on large rainbow trout. *Transactions of the American Fisheries Society* 77:61-64.
- Henry, T.B. and J.M. Grizzle. 2003. Electroshocking-Induced Injuries in Newly Transformed Juvenile Fish. *Journal of Aquatic Animal Health* 15:147-157.
- Henry, T. B., J. M. Grizzle, and M. J. Maceina. 2003. Electroshocking-induced mortality of four fish species during posthatching development. *Transactions of the American Fisheries Society* 132:299-306.

- Henry, T. B., J. M. Grizzle, C. E. Johnston, and J. A. Osborne. 2004. Susceptibility of ten fish species to electroshock-induced mortality. *Transactions of the American Fisheries Society* 133:649–654.
- Hollender, B.A. and R.F. Carline. 1994. Injury to Wild Brook Trout by Backpack Electrofishing. *North American Journal of Fisheries Management* 14:643-649.
- Holliman, F.M and J.B. Reynolds. 2002. Electroshock-Induced Injury in Juvenile White Sturgeon. *North American Journal of Fisheries Management* 22:494-499.
- Holliman, F.M and J.B. Reynolds. 2003. Electroshock-Induced Injury and Mortality in the Spotfin Chub, a Threatened Minnow. *North American Journal of Fisheries Management* 23:962–966.
- Holliman, F.M, J.B. Reynolds, and T.J. Kwak. 2003. A Predictive Risk Model for Electroshock-Induced Mortality of the Endangered Cape Fear Shiner. *North American Journal of Fisheries Management* 23: 905-912.
- Holliman, F.M., T.J. Kwak, W.G. Cope, and J.F. Levine. 2007. Exposure of Unionid Mussels to Electric Current: Assessing Risks Associated with Electrofishing. *Transactions of the American Fisheries Society* 136:1593-1606.
- Holmes. R., D. N. McBride, T. Viavant. and J. B. Reynolds. 1990. Electrofishing induced mortality and injury to rainbow trout, Arctic grayling, humpback whitefish, least cisco and northern pike. Alaska Department of Fish and Game, Division of Sport Fish, Fishery Manuscript 90-3, Anchorage.
- Hudy, M. 1985. Rainbow trout and brook trout mortality from high voltage AC electrofishing in a controlled environment. *North American Journal of Fisheries Management* 5:475–479.
- Kocovsky, P. M., C. Gowan, K. D. Fausch, and S. C. Riley. 1997. Spinal injury rates in three wild trout populations in Colorado after eight years of backpack electrofishing. *North American Journal of Fisheries Management* 17:308–313.
- Kynard, B., and E. Lonsdale. 1975. Experimental study of galvanonarcosis for rainbow trout (*Salmo gairdneri*) immobilization. *Journal of the Fisheries Research Board of Canada* 32:300–302.
- Lamarque, P. 1990. Electrophysiology of fish in electric fields. Pages 4–31 in I. G. Crowx and P. Lamarque, editors. *Fishing with electricity: applications in freshwater fisheries management*. Fishing News Books, London.
- Maule, A.G and M.G. Mesa. 1994. Efficacy of Electrofishing to Assess Plasma Cortisol Concentration in Juvenile Chinook Salmon Passing Hydroelectric Dams on the Columbia River. *North American Journal of Fisheries Management* 14:334-339.

- Maxfield, G. H., R. H. Lander, and K. L. Liscom. 1971. Survival, growth, and fecundity of hatchery-reared rainbow trout after exposure to pulsating direct current. *Transactions of the American Fisheries Society* 100:546–552.
- McMichael, G. A. 1993. Examination of electrofishing injury and short-term mortality in hatchery rainbow trout. *North American Journal of Fisheries Management* 13:229–233.
- McMichael, G. A., A. L. Fritts, and T. N. Pearsons. 1998. Electrofishing injury to stream salmonids: injury assessment at the sample, reach, and stream scales. *North American Journal of Fisheries Management* 18:894–904.
- Mesa, M. G., and C. B. Schreck. 1989. Electrofishing mark-recapture and depletion methodologies evoke behavioral and physiological changes in cutthroat trout. *Transactions of the American Fisheries Society* 118:644–658.
- Mesick, C.F. and J.C. Tash. 1980. Effects of electricity of some benthic stream insects. *Transactions of the American Fisheries Society* 109:417-422.
- Miranda, L.E. 2005. Refining Boat Electrofishing Equipment to Improve Consistency and Reduce Harm to Fish. *North American Journal of Fisheries Management* 25:609–618.
- Mitton, C. J. A., and D. G. McDonald. 1994. Consequences of pulsed DC electrofishing and air exposure to rainbow trout (*Oncorhynchus mykiss*). *Canadian Journal of Fisheries and Aquatic Sciences* 51:1791–1798.
- Muth, R. T., and J. B. Ruppert. 1996. Effects of two electrofishing currents on captive ripe razorback suckers and subsequent egg-hatching success. *North American Journal of Fisheries Management* 16:473–476.
- Peterson, J.T., N.P. Banish, and R.F. Thurow. 2005. Are Block Nets Necessary?: Movement of Stream-Dwelling Salmonids in Response to Three Common Survey Methods. *North American Journal of Fisheries Management* 25:732–743.
- Pratt, V. S. 1955. Fish mortality caused by electrical shockers. *Transactions of the American Fisheries Society* 84:93–96.
- Redman, S. D., J. R. Meinertz, and M. P. Gaikowski. 1998. Effects of immobilization by electricity and MS-222 on brown trout broodstock and their progeny. *Progressive Fish-Culturist* 60:44–49.
- Reynolds, J.B. 1996. Electrofishing. Pages 221 – 253 In B.R. Murphy and D.W. Willis (eds.). *Fisheries Techniques*, 2nd Edition. American Fisheries Society, Bethesda, Maryland.

- Reynolds, J. B., and F. M. Holliman. 2000. Guidelines for assessment and reduction of electrofishing induced injuries in trout and salmon. Pages 235–240 in D. Schill, S. Moore, P. Byorth, and B. Hamre, editors. Management in the new millennium: are we ready? Wild Trout VII, Beyond Words, Fort Collins, Colorado. Available: <http://www.sfos.uaf.edu/shockingnews/effects/guidelines/studyguide.html>.
- Reynolds, J.B. and F.M. Holliman. 2004. Injury of American Eels Captured by Electrofishing and Trap-Netting. North American Journal of Fisheries Management 24: 686-689.
- Reynolds, J. B., and A. L. Kolz. 1988. Electrofishing injury to large rainbow trout. North American Journal of Fisheries Management 8:516–518.
- Roach, S. M. 1999. Influence of electrofishing on the mortality of Arctic grayling eggs. North American Journal of Fisheries Management 19:923–929.
- Rose, J. D. 2002. The neurobehavioral nature of fishes and the question of awareness and pain. Reviews in Fisheries Science 10:1–38.
- Rose, J. D. 2007. Anthropomorphism and ‘mental welfare’ of fishes. Diseases of Aquatic Organisms 75:139–154.
- Roth, B., D. Møller, and E. Slinde. 2004. Ability of electric field strength, frequency, and current duration to stun farmed Atlantic salmon and pollock and relations to observed injuries using sinusoidal and square wave alternating current. North American Journal of Aquaculture 66:208–216.
- Schill, D. J., and F. S. Elle. 2000. Healing of electroshock-induced hemorrhages in hatchery rainbow trout. North American Journal of Fisheries Management 20:730–736.
- Schneider, J. C. 1992. Field evaluations of 230-V AC electrofishing on mortality and growth of warmwater and coolwater fish. North American Journal of Fisheries Management 12:253–256.
- Schreck, C. B., R. A. Whaley, M. L. Bass, O. E. Maughan, and M. Solazzi. 1976. Physiological responses of rainbow trout (*Salmo gairdneri*) to electroshock. Journal of the Fisheries Research Board of Canada 33:76–84.
- Schreer, J. F., S. J. Cooke, and K. B. Connors. 2004. Electrofishing-induced cardiac disturbance and injury in rainbow trout. Journal of Fish Biology 64:1–19.
- Sharber, N. G., and S. W. Carothers. 1988. Influence of electrofishing pulse shape on spinal injuries in adult rainbow trout. North American Journal of Fisheries Management 8:117–122.

- Sharber, N.G., S.W. Carothers, J.P. Sharber, J.C. De Vos, Jr., and D.A. House. 1994. Reducing Electrofishing-Induced Injury of Rainbow Trout. *North American Journal of Fisheries Management* 14:340-346.
- Sharber, N.G. and J.S. Black. 1999. Epilepsy as a Unifying Principle in Electrofishing Theory: A Proposal. *Transactions of the American Fisheries Society* 128:666-671.
- Siepkner, M.J., D.H. Wahl, D.P. Philipp, and K.G. Ostrand. 2006. Evidence of Reduced Reproductive Success of Nesting Largemouth Bass Sampled with Standard Electrofishing Procedures. *North American Journal of Fisheries Management* 26: 631-635.
- Sigourney, D.B., G.E. Horton, T.L. Dubreuil, A.M. Varaday, and B.H. Letcher. 2005. Electroshocking and PIT Tagging of Juvenile Atlantic Salmon: Are There Interactive Effects on Growth and Survival? *North American Journal of Fisheries Management* 25:1016-1021.
- Snyder, D. E. 2003. Electrofishing and its harmful effects on fish. Information and Technology Report USGS/BRD/ITR-2003-0002. U.S. Government Printing Office, Denver.
- Spencer, S. L. 1967. Internal injuries of largemouth bass and bluegills caused by electricity. *Progressive Fish-Culturist* 29:168-169.
- Taube, T. T. 1992. Injury, survival, and growth of rainbow trout captured by electrofishing. Master's thesis. University of Alaska. Fairbanks.
- Taylor, B.W., A.R. McIntosh, and B.L. Peckarsky. 2001. Sampling stream invertebrates using electroshocking techniques: implications for basic and applied research. *Canadian Journal of Fisheries and Aquatic Sciences* 58:437-445.
- Tesch, A. H., D. Aro, G. Clark, D. Kucipeck, and J. D. Mahan. 1999. Effects of varying voltage and pulse pattern during electrical immobilization of adult chum salmon on egg survival to the eyed stage. *North American Journal of Aquaculture* 61:355-358.
- Thompson, K. G., E. P. Bergersen, and R. B. Nehring. 1997a. Injuries to brown trout and rainbow trout induced by capture with pulsed direct current. *North American Journal of Fisheries Management* 17:141-153.
- Thompson, K. G., E. P. Bergersen, R. B. Nehring, and D. C. Bowden. 1997b. Long-term effects of electrofishing on growth and body condition of brown trout and rainbow trout. *North American Journal of Fisheries Management* 17:154-159.
- Tipping, J. M., and G. J. Gilhuly. 1996. Survival of electroanesthetized adult steelhead and eggs of fall chinook salmon. *North American Journal of Fisheries Management* 16:469-472.

- Van Zee, B.E., C.S. Guy, and D.W. Willis. 1994. Electrofishing injury rates for largemouth bass, smallmouth bass, and bluegills collected with pulsed DC and high output, pulsed AC. *Proceedings South Dakota Academy of Science* 73:43-50.
- VanderKooi, S. P., A. G. Maule, and C. B. Schreck. 2001. The effects of electroshock on immune function and disease progression in juvenile spring Chinook salmon. *Transactions of the American Fisheries Society* 130:397–408.
- Wahl, D.H. L.M. Einfalt, and S.P. Callahan. 2007. Effects of Electroshock on Bluegill Feeding and Susceptibility to Predation. *North American Journal of Fisheries Management* 27: 1208-1213.
- Walsh, M.G. D.L. Winkelman, and R.J. Bahr. 2004. Electrofishing Injury and Short-Term Mortality in Hatchery-Reared Rainbow Trout Stocked into an Ozark Stream. *North American Journal of Fisheries Management* Volume 24, Issue 1 (February) pp. 316-321
- Whaley, R. A., O. E. Maughan, and P. H. Wiley. 1978. Lethality of electroshock to two freshwater fishes. *Progressive Fish-Culturist* 40:161–163.
- Zydlewski, G.B., W. Gale, J. Holmes, J. Johnson, T. Brigham, and W. Thorson. 2008. Use of Electroshock for Euthanizing and Immobilizing Adult Spring Chinook Salmon in a Hatchery. *North American Journal of Aquaculture* 70: 415-424.