

# CURRICULUM VITAE

University of Idaho

**NAME:** Madison S. Powell

**DATE:** January 5, 2018

**RANK OR TITLE:** Associate Professor, Department of Animal and Veterinary Science  
Associate Director, Aquaculture Research Institute, Hagerman Fish Culture Experiment Station

**DEPARTMENT:** Animal and Veterinary Science

**OFFICE LOCATION AND CAMPUS ZIP:**

Hagerman Fish Culture Experiment Station  
3059F National Fish Hatchery Road  
Hagerman, ID 83332

**OFFICE PHONE:** 208-837-9096

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**DATE OF FIRST EMPLOYMENT AT UI:** June 1995

**DATE OF TENURE:** Tenured July 2008

**DATE OF PRESENT RANK OR TITLE:** July 2008

**EDUCATION BEYOND HIGH SCHOOL:**

**Degrees:**

Ph.D., Texas Tech University, Lubbock, TX, Zoology, 1995

M.S., University of Idaho, Moscow, ID, Zoology, 1990

B.S., University of Idaho, Moscow, ID, Zoology and Biology, 1985

**EXPERIENCE:**

**Teaching, Extension and Research Appointments:**

Associate Professor / Graduate Faculty, Bioinformatics and Computational Biology Faculty,  
Department of Animal and Veterinary Science, Aquaculture Research Institute, Hagerman  
Fish Culture Experiment Station, University of Idaho, Hagerman, Idaho, 2008 – present

Assistant Professor / Graduate Faculty, Department of Animal and Veterinary Science, Aquaculture  
Research Institute, Hagerman Fish Culture Experiment Station, University of Idaho,  
Hagerman, Idaho, 2002 – 2008

Research Assistant Professor, Department of Animal and Veterinary Science / Department of Fish  
and Wildlife Resources, Aquaculture Research Institute, Hagerman Fish Culture Experiment  
Station, University of Idaho, Hagerman, Idaho, 2001 – 2002

Research Scientist, Aquaculture Research Institute, Hagerman Fish Culture Experiment Station,  
University of Idaho, Hagerman, Idaho, 1997 – 2001

Research Scientist, Aquaculture Research Institute, University of Idaho, Moscow, Idaho, 1996 – 1997

Postdoctoral Scientist, Aquaculture Research Institute, University of Idaho, Moscow, Idaho, 1995 –  
1996

Graduate Teaching / Research Assistant, Department of Biological Sciences, Texas Tech University,  
Lubbock, Texas, 1990 – 1995

Graduate Research Assistant, Human Research Laboratory, Los Alamos National Laboratory, Los  
Alamos, New Mexico, Summer 1991 – 1993

Graduate Teaching Assistant, Department of Biological Sciences, University of Idaho, Moscow,  
Idaho, 1988 – 1990

**Academic Administrative Appointments:**

Associate Director, Aquaculture Research Institute, Hagerman Fish Culture Experiment Station,  
University of Idaho, 2002 – present

**Non-Academic Employment including Armed Forces:**

Pilot/OTS, United States Air Force, 1986-87 (inactive reserve 1987-1992)  
Biological Stores manager, University of Idaho, 1986  
Laboratory technician, Biological Stores, University of Idaho, 1984-1986  
Laboratory technician, University of Idaho Herbarium, 1983-1984  
Cadet, United States Military Academy, 1981 – 1982

**Consulting:**

Enslow Publishing Inc. technical/scientific consultant/reviewer: Lakes and Rivers (forensic science experiments series textbook for 3rd grade students), 2006  
GEI Consultants, Geneticist for Intermountain subbasin management plans for the Northwest Power and Conservation Council, 2003  
Landcatch Natural Selection, Genetic consultant for construction of an RT-QPCR assay for infectious pancreatic necrosis virus, 2001-2003  
Montgomery Watson, Genetic consultant involving selenium toxicity in cutthroat trout, 1999-2000  
Infosight Corporation, technical consultant for writing (molecular genetics), 1999  
Enslow Publishing Inc. technical/scientific consultant/reviewer: Cloning (6th grade level biotechnology textbook), 1998

**Areas of Specialization:**

Aquaculture / artificial production / hatchery selection /  
molecular diagnostics of fish diseases/ fish genetics / genomics

**TEACHING ACCOMPLISHMENTS:****Courses Taught:**

Coldwater Aquaculture short course FISH 503, Summer 2017  
The Blue Revolution and the Future of Wild Fish, ISEM 301, Spring 2017  
Ichthyology, FISH 481, Spring 2014, 2015  
Practical Methods in Analyzing Animal Science Experiments, AVS 504, Summer 2010, 2012, 2014  
Macronutrient Metabolism, AVS 504, Summer 2011, 2013  
Agricultural & Life Science Systems in Taiwan Ag Ed 409, 2008-present  
Fish Genetics, FISH 404/504, Summer 2002, 2004  
Conservation Genetics Short Course, WILDLIFE 503, Fall 2001  
Fisheries Biotechnology Seminar, FISH 502, Fall 1997  
Cytogenetic Techniques ZOOLOGY 540, Spring 1995  
Experimental Genetics, ZOOLOGY 330, Fall 1994  
General Zoology laboratories, BIOL 201, Fall/Spring/Fall 1988-1989  
General Biology laboratories, BIOL 100, Spring 1990

**Students Advised:****Current Students:**

Patrick Blaufuss, PhD candidate, Animal and Veterinary Science  
Tracy Kennedy, PhD student, Fish and Wildlife Resources

**Advised to completion of degree as major professor:**

Dana Weigel, PhD, 2013, Fish and Wildlife Resources  
Shawn Narum, PhD, 2006, Fish and Wildlife Resources

Catherine Willard, MS, 2005, Fish and Wildlife Resources  
 Brian Leth, MS, 2005, Fish and Wildlife Resources  
 Michael Peterson, MS, 2004, Fish and Wildlife Resources  
 Joyce Faler, MNS, 2002, Fish and Wildlife Resources

Served on graduate committee:

Lisa Armbruster, MS, 2017, Animal and Veterinary Science  
 Alejandro Villesante, PhD, 2015, Animal and Veterinary Science  
 Neil Ashton, MS, 2013, Fish and Wildlife Resources  
 Amy Long, PhD, 2012, Fish and Wildlife Resources  
 Kalyan Chapalamadugu, PhD, 2011, Animal and Veterinary Science  
 Caron Goldberg, PhD, 2010, Fish and Wildlife Resources  
 Jurij Wayck, PhD, 2009, Animal and Veterinary Science  
 Madhusudhan Papasani, PhD, 2008, Animal and Veterinary Science  
 Luis Mazuera, MNS, 2004, Fish and Wildlife Resources  
 Wade Cavender, MS, 2003, Fish and Wildlife Resources  
 Scott Host, MS, 2003, Fish and Wildlife Resources  
 Jeff Stephenson, MS, 2003, Fish and Wildlife Resources  
 Paul Anders, PhD, 2002, Fish and Wildlife Resources  
 Matthew Campbell, MS, 2001, Fish and Wildlife Resources

Current Graduate Committees:

Andreas Brezas, PhD candidate, Animal and Veterinary Science  
 Daniel Avila, MS student, Universidad Nacional Autonoma de Mexico

Postdoctoral Researchers:

Karen Plant, 2006 - 2007, 2011 - 2012

**Materials Developed:**

Laboratory Manual for Ichthyology FISH 481  
 Manual and protocols for Filer High School biotechnology class, 2007  
 Manual and protocols for QPCR Workshop (USFWS), 2006

**Courses Developed:**

The Blue Revolution and the Future of Wild Fish, ISEM 301  
 Ichthyology, FISH 481  
 Experimental Design, AVS 504 (with Dr. P. Rezamand)  
 Macronutrient Metabolism, AVS 504 (with Dr. P. Rezamand)  
 Fish Genetics Short Course, FISH 404/504  
 Conservation Genetics Short Course, WILDLIFE 503  
 Fisheries Biotechnology Seminar, FISH 501

**Non-credit Classes, Workshops, etc.:**

Fishes of the Wood River Basin. Sagebrush Saturdays community outreach program workshop, 2017  
 Application of Molecular Techniques in Aquaculture Nutrition, Universidad Nacional Autonoma de Mexico (UNAM), Mexico City, Mexico, 2016  
 Coldwater Aquaculture short course for Native American Tribes and Idaho Department of Fish and Game, 2011  
 Use of aquaculture for freshwater and marine fish species in stock enhancement for the Univ. of Maryland, Eastern Shore and Univ. of Arkansas, Pine Bluff, 2007  
 Quantitative PCR workshop, USFWS, California-Nevada Fish Health Center, 2006  
 Genetics section, Native American Aquaculture short course, 2004  
 Technical training workshop for automated fragment analysis, 2003.  
 Genetics for Fisheries Managers (IDFG continuing education course), 2003  
 Technical training workshop for automated fragment analysis, 2003

Tribal Supplementation Workshop, CRITFC, Genetic Constraints, 2002  
 Newer diagnostic methods for fish diseases with an emphasis on PCR testing, 2002  
 Aquaculture in the Classroom, conservation aquaculture, 2001  
 Genetic techniques for differentiating fish stocks, 22nd Smolt Workshop / Symposium, 2000  
 American Fisheries Society, Symposium, The detection, status, and management of introgressed populations of cutthroat, 2000  
 Molecular Genetics in Fisheries: a course for geneticists (USFS continuing education course), 2000  
 Practical Genetics Methods for Fisheries Biologists (USFWS continuing education course), 2000  
 Genetic Guidelines for Fisheries Management (USFS continuing education course), 2000  
 Technical training workshop for quantitative PCR, 2000  
 Aquaculture Research Institute workshops (2) on Conservation Fisheries and Aquaculture, 2000  
 Snake River Steelhead Genetics Workshop, 2000  
 Aquaculture: Birth-to-Release Workshop 1999  
 Practical Genetics for Fisheries Managers (AFS continuing education course), 1999  
 Technical training workshop for quantitative PCR, 1999  
 Columbia River White Sturgeon Genetics workshop, 1998  
 Upward Bound Aquaculture Short Course, 1997  
 Short Course in Aquaculture for UI Agricultural Education, 1996

## SCHOLARSHIP ACCOMPLISHMENTS:

### Publications:

#### Refereed/Adjudicated:

- Novriadi, R., M. Rhodes, M. Powell, T. Hanson, D.A. Davis. 2017. Effects of soybean meal replacement with fermented soybean meal on growth, serum biochemistry and morphological condition of liver and distal intestine of Florida pompano *Trachinotus carolinus*. *Aquaculture Nutrition*, DOI: 10.1111/anu.12645
- Powell, M., R.W. Hardy, A.M. Hutson, L.A. Toya and D. Tave. 2017. Comparison of body composition and fatty acid profiles between wild and cultured Rio Grande silvery minnow, *Hybognathus Amarus*. *Journal of Fish and Wildlife Management*. 8(2):487-496.
- Ashton, N. K., M. R. Campbell, P. J. Anders, M. S. Powell and K. D. Cain. 2016. Multiplexing of microsatellite markers for parentage-based tagging of hatchery burbot. *Northwest Science*. 90(3):249-259.
- Elizondo-Reynal, E., R. Medina-González, M. G. Nieto-López, R. Ortiz-López, R. Elizondo-González, M. S. Powell, D. Ricque-Marie and L. E. Cruz-Suárez. 2016. Consumption of *Ulva clathrata* as a dietary supplement stimulates immune and lipid metabolism genes in Pacific white shrimp *Litopenaeus vannamei*. *Journal of Applied Phycology*. DOI 10.1007/s10811-016-0889-1.
- Villasante, A., M. Powell, G. K. Murdoch, K. Overturf, K. Cain, J. Wacyk, R. W. Hardy. 2016. Effect of anthocyanidins on myogenic differentiation 1 in induced and non-induced primary myoblasts from rainbow trout (*Oncorhynchus mykiss*). *Comparative Biochemistry and Physiology, Part B*. 196-197:102-108.
- Villasante, A., M. S. Powell, K. A. Moutou, G. K. Murdoch, K. Overturf, J. Wacyk, and R. W. Hardy. 2016. Effects of anthocyanidins in myogenic differentiation and antioxidant defense in primary myogenic cells isolated from rainbow trout (*Oncorhynchus mykiss*). *Aquaculture* 454:81-89.
- Villasante, A., B. Patro, B. Chew, A. Brezas, M. Becerra, J. Wacyk, K. Overturf, M. S. Powell and R. W. Hardy. 2015. Dietary intake of purple corn extract reduces adiposity and improves antioxidant capacity and n-3 PUFA profile in plasma of rainbow trout (*Oncorhynchus mykiss*). *Journal of World Aquaculture Society* 46:381-394.

- Lee, K., S. Rahimnejad, M. S. Powell, F. T. Barrows, S. Smiley, P. Bechtel and R.W. Hardy. 2015. Salmon testes meal as a functional feed additive in fish meal and plant-protein based diets for rainbow trout (*Oncorhynchus mykiss* Walbaum) and Nile tilapia (*Oreochromis niloticus*) fry. *Aquaculture Research*, 46: 1590-1596.
- Weigel, D. E., P. J. Connolly and M. S. Powell. 2014. Fluvial rainbow trout contribute to the colonization of steelhead (*Oncorhynchus mykiss*) in a small stream. *Environmental Biology of Fishes* 97:1149-1159.
- Sealey W. M, F.T. Barrows, C.E. Smith, J.M. Wacyk, B.C. Donahower, M.S. Powell, R.W. Hardy and E.A. Shelden. 2013. Heat shock protein regulation in rainbow trout, *Oncorhynchus mykiss*, is altered by dietary soybean meal inclusion and anti-phospholipase A2 antibody. *Journal of the World Aquaculture Society* 44(5):655-668.
- Weigel, D. E., P. J. Connolly and M. S. Powell. 2013. The impact of small irrigation diversion dams on the recent migration rates of steelhead and redband trout (*Oncorhynchus mykiss*). *Conservation Genetics* 14:1255-1267.
- Weigel, D, P. Connolly, K. Martens and M. Powell. 2013. Colonization of steelhead (*Oncorhynchus mykiss*) in a natal stream after barrier removal. *Transactions of the American Fisheries Society* 142: 920-930.
- Santin, A.E., A.J. Searle, V.D. Winston, M.S. Powell, R.W. Hardy and K.J. Rodnick. 2013. Glycated hemoglobin is not an accurate indicator of glycemia in rainbow trout. *Comparative Biochemistry and Physiology, Part A* 165: 343-352.
- Wacyk, J., M. Powell, K. Rodnick, K. Overturf, R.A. Hill, and R. Hardy. 2012. Dietary protein source significantly alters growth performance, plasma variables and hepatic gene expression in rainbow trout (*Oncorhynchus mykiss*) fed amino acid balanced diets. *Aquaculture* 357: 223-234.
- Anders, P., A. Drauch-Shreier, B. May, J. Rodzen, M. Powell, and S. Narum. 2011. A review of genetic evaluation tools for conservation and management of sturgeons: Roles, benefits, and limitations. *Journal of Applied Ichthyology* 27(2):3-11
- Campbell, M. R., C.M. Kozfkay, K.A. Meyer, M.S. Powell and R. N. Williams 2011. Historical influences of volcanism and glaciation in shaping mitochondrial DNA variation and distribution in Yellowstone cutthroat trout *Oncorhynchus clarki bouvieri* across its native range. *Transactions of the American Fisheries Society* 140: 91-107.
- Lee, K.J., M.S. Powell, F.T. Barrows, S. Smiley, P. Bechtel and R.W. Hardy 2010. Evaluation of supplemental fish bone meal made from Alaska seafood processing byproducts and dicalcium phosphate in plant-protein based diets for rainbow trout (*Oncorhynchus mykiss*). *Aquaculture* 302:248-255
- Powell, M.S., R.W. Hardy, T.A. Flag and P.A. Kline. 2010. Proximate composition and energy content of migrating wild and planted Redfish Lake sockeye salmon (*Oncorhynchus nerka*). *North American Journal of Fisheries Management* 30:530-537.
- Foltz, J.R., K.P. Plant, K. Overturf, K. Clemons, and M.S. Powell. 2009. Detection of *Nucleospora salmonis* in steelhead, *Oncorhynchus mykiss* (Walbaum) using quantitative polymerase chain reaction (qPCR). *Journal of Fish Diseases* 32:551-555.
- Chapalamadugu, K.C., B.D. Robison, R.E. Drew, M.S. Powell, R.A. Hill, J.J. Amberg, K.J. Rodnick, R.W. Hardy, M.L. Hill and G.K. Murdoch. 2009. Dietary carbohydrate level affects transcription factor expression that regulates skeletal muscle myogenesis in rainbow trout. *Journal of Comparative Physiology Part B* 153:66-72.

- Rodnick, K.J., S. St. Hilare, P.K. Battiprolu, S.S. Seiler, M.L. Kent, M.S. Powell and J.L. Ebersole. 2008. Habitat selection influences sex distribution, morphology, tissue biochemistry, and parasite load of juvenile Coho salmon in the West Fork Smith River, Oregon. *Transactions of the American Fisheries Society* 137:1571-1590.
- Drew, R.E., K.J. Rodnick, M. Settles, J. Wacyk, E. Churchill, M.S. Powell, R.W. Hardy, G.K. Murdoch, R.A. Hill, and B.D. Robison. 2008. Effect of starvation on gene expression in brain and liver of zebrafish (*Danio rerio*). *Physiological Genomics* 35:283-295.
- Robison, B.D., R.E. Drew, G.K. Murdoch, M.S. Powell, K.J. Rodnick, M. Settles, D. Stone, E. Churchill, R.A. Hill, M.R. Pappasani, S.S. Lewis, and R.W. Hardy. 2008. Sexual dimorphism in hepatic gene expression and the response to the dietary carbohydrate manipulation in the zebrafish (*Danio rerio*) *Comparative Biochemistry and Physiology, Part D: Genomics and Proteomics*, 3:141-154.
- Kozfkay, C.C., M.R. Campbell, J. Heindel, D. Baker, P. Kline, M.S. Powell and T. Flagg. 2008. A genetic evaluation of relatedness for broodstock management of captive, endangered Snake River sockeye salmon, (*Oncorhynchus nerka*). *Conservation Genetics* 9:1421-1430.
- Narum, S.R., D. Hatch, A.J. Talbot, P. Moran, and M.S. Powell. 2008. Iteroparity in complex mating systems of steelhead trout. *Journal of Fish Biology* 72:45-60.
- Narum, S.R., W.D. Arnsberg, A.J. Talbot, and M.S. Powell. 2007. Reproductive isolation following reintroduction of Chinook salmon with alternate life histories. *Conservation Genetics* 8:1123-1132.
- Kozfkay, C.C., M.R. Campbell, S. Yundt, M. Peterson, and M.S. Powell. 2007. Incidence of hybridization between naturally sympatric westslope cutthroat trout and rainbow trout in the Middle Fork Salmon River drainage, Idaho. *Transactions of the American Fisheries Society* 136:624-638.
- Powell, M.S. 2006. Fish genetics and aquaculture biotechnology: book review. *Aquaculture Research* 37(6): 652-653
- Narum, S.R., M.S. Powell, R. Evenson, B. Sharp, and A.J. Talbot. 2006. Microsatellites reveal population substructure of Klickitat River native steelhead trout (*Oncorhynchus mykiss*) and genetic divergence from an introduced stock. *North American Journal of Fisheries Management* 26:147-155.
- Cegelski, C.C., M.R. Campbell, K.A. Meyers and M.S. Powell. 2006. Multi-scale genetic structure of Yellowstone cutthroat trout *Oncorhynchus clarki bouvieri* in the upper Snake River basin. *Transactions of the American Fisheries Society* 135:711-726.
- Narum, S.R., S. Boe, P. Moran and M.S. Powell. 2006. Small scale genetic structure and variation in steelhead trout of the Grande Ronde River, Oregon USA. *Transactions of the American Fisheries Society* 135:979-986.
- Powell, M.S., K. Overturf, C. Hogge, and K. Johnson. 2005. Detection of *Renebacterium salmoninarum* in Chinook salmon *Oncorhynchus tshawytscha* using quantitative PCR. *Journal of Fish Diseases* 28:615-622.
- Cavender, W.P., J.S. Wood, M.S. Powell, K. Overturf, and K.D. Cain. 2004. Real-time quantitative polymerase chain reaction (QPCR) to identify *Myxobolus cerebralis* in rainbow trout *Oncorhynchus mykiss*. *Diseases of Aquatic Organisms* 60:205-213
- Narum, S.R., M.S. Powell and A. Talbot. 2004. A distinctive microsatellite locus that differentiates ocean-type from stream-type Chinook salmon in the interior Columbia River basin.

*Transactions of the American Fisheries Society* 133:1051-1055

- Narum, S.R., C. Contor, A. Talbot and M.S. Powell. 2004. Genetic divergence of sympatric resident and anadromous forms of *Oncorhynchus mykiss* in the Walla Walla River, U.S.A. *Journal of Fish Biology* 65:471-488.
- Brannon, E.L., M.S. Powell, T.P. Quinn and A. Talbot. 2004. Population structure of Columbia River basin Chinook salmon and steelhead trout. *Reviews in Fisheries Science* 12:99-232.
- Gamperl, A.K., K.J. Rodnick, H.A. Faust, E.C. Venn, M.T. Bennett, L. I. Crawshaw, E.R. Keeley, M.S. Powell and H.W. Li. 2003. Metabolism, swimming performance, and tissue biochemistry of high desert redband trout (*Oncorhynchus mykiss* ssp.): Evidence for phenotypic differences in physiological function. *Physiological and Biochemical Zoology* 75:413-431.
- Campbell, M.R., J. Dillon, and M.S. Powell. 2002. Hybridization and introgression in a managed, native Yellowstone cutthroat *Oncorhynchus clarki bowieri* population, Henrys Lake, Idaho: genetic detection and management implications. *Transactions of the American Fisheries Society* 131:364-375.
- Overturf, K., S. La Patra, and M.S. Powell. 2001. Real-time PCR for the detection and quantitative analysis of IHNV in salmonids. *Journal of Fish Diseases* 24:325-333.
- Paragamian, V.L., M.S. Powell and J.C. Faler. 1999. Mitochondrial DNA analysis of burbot stocks in the Kootenai River basin of British Columbia, Montana and Idaho. *Transactions of the American Fisheries Society* 128:868-874.
- Powell, M.S., J.G. Owen, and R.D. Bradley. 1993. Noteworthy records of bats from Honduras. *The Texas Journal of Science* 45(2):179-181.
- Huang, J., M. Powell, and R.A. Mead. 1993. Luteal protein secretion during preimplantation in the ferret. *Biology of Reproduction* 48(3):647-654.

**Peer Reviewed/Evaluated:**

- Worden, S., J. Davis, A. Roe, M. Powell, C. Hunt, R. Hernandez, S. Dunlap, S. Ramsay. 2017. Repeated exposure increases children's intake of Idaho Trout: a pilot study with young children. *Journal of Nutrition Education and Behavior* 49:7, S72
- Powell, M., T. Kennedy, J. Faler and R. Hardy. 2013. Gene expression in rainbow trout (*Oncorhynchus mykiss*), Nile tilapia (*Oreochromis niloticus*) and white sturgeon (*Acipenser transmontanus*) erythrocytes under differing in vitro glycemic conditions. In: Proceedings of the XII International Symposium on Aquaculture Nutrition, Villahermosa, MX.
- Powell, M.S., V.L. Paragamian and J. Dunnigan. 2008. Mitochondrial variation in North American burbot, *Lota lota*, with special reference to the Kootenai River in Idaho and Montana. Pp 3-27 In: Burbot Ecology Management and Culture (V.L. Paragamian and D.H. Bennett eds.) American Fisheries Society Symposium #59, American Fisheries Society, Bethesda, MD.
- Peterson, M.P., M.R. Campbell, C.C. Cegelski and M.S. Powell. 2004. Introgressive hybridization between westslope cutthroat trout and native rainbow trout in Big Creek, Idaho. Pp. 193-206 In: Propagated Fishes in Resource Management (M.J. Nickham, P.M. Mazik, J.G. Nickham, and D.D. MacKinlay, eds.) Special Symposium #44, American Fisheries Society, Bethesda, MD.
- Flagg, T.A., W.C. McAuley, P.A. Kline, M.S. Powell, D. Taki and J.C. Gislason. 2004. Application of Captive broodstocks to preservation of ESA-listed stocks of Pacific salmon: Redfish Lake sockeye salmon case example. Pp. 383-396 In: Propagated Fishes in Resource Management

(M.J. Nickham, P.M. Mazik, J.G. Nickham, and D.D. MacKinlay, eds.) Special Symposium #44, American Fisheries Society, Bethesda, MD.

Williams, R., J. Lichatowich, P. Mundy and M. Powell. 2003. Integrating artificial production with Salmonid life history, genetic and ecosystem diversity: A landscape perspective. Special Publication of Trout Unlimited. <http://www.tu.org>

Beasley, C., S.R. Narum, J. Whiteaker, A. Talbot, D. Hatch, and M. Powell. 2002. Evaluating the Effects of Mixing Upper Columbia River Spring Chinook Salmon (*Oncorhynchus tshawytscha*, Walbaum) in the Methow Basin, Washington and Providing a Scientific Basis for Future Management and Research. Pp. 37-42 In: Hatchery Reform: the Science and the Practice (E. Brannon and D. MacKinlay, eds.) International Congress on the Biology of Fishes, Symposium, Vancouver, Canada.

Powell, M.S., and P.A. Kline. 2002. The use of cryopreserved milt to maintain genetic diversity in captive broodstocks. Pp. 155-157 In: Hatchery Reform: the Science and the Practice (E. Brannon and D. MacKinlay, eds.) International Congress on the Biology of Fishes, Symposium, Vancouver, Canada.

Anders, P.J., D.L. Richards, and M.S. Powell. 2002. The first endangered white sturgeon population (*Acipenser transmontanus*): Repercussions in an altered large river-flood-plain ecosystem. Pp. 67-82 In: Biology, Management, and Protection of North American Sturgeon (W. Van Winkle, ed.) Special Symposium #28, American Fisheries Society, Bethesda, MD.

Anders, P.J., C.R. Gelok and M.S. Powell. 2001. Population structure and mitochondrial DNA (mtDNA) diversity in North American white sturgeon (*Acipenser transmontanus*). Proceedings of the Fourth International Sturgeon Symposium. Oshkosh, WI.

Powell, M.S., V.L. Paragamian and J.C. Faler. 2000. Genetic Characteristics of Burbot in the Kootenai River Drainage of Montana, Idaho and British Columbia. Pp. 25-27 In: Burbot: Biology, Ecology and Management (V.L. Paragamian and D.W. Willis, eds.). Fisheries Management Section of American Fisheries Society, Publication #1. Spokane, WA.

Anders, P. and M. Powell. 1998. Comprehensive management and conservation of Columbia Basin white sturgeon (*Acipenser transmontanus*): A zoogeographic approach. Pp. 53-54 In: Proceedings of Ecosystem Based Management in the Upper Columbia River Basin. Castlegar, British Columbia, Canada.

Baker, R.J., A.D. Simmons, M.S. Powell, J.L. Longmire, and R.D. Bradley. 1996. Utility of a satellite DNA sequence as a genetic marker in a hybrid zone of pocket gophers (Genus *Geomys*). Pp. 25-34 In: Contributions in Mammalogy: A memorial volume honoring J. Knox Jones Jr. (H.H. Genoways and R.J. Baker, eds.) Museum of Texas Tech University, Lubbock, Texas.

#### **Book Chapters:**

Williams, R.N. and M.S. Powell. 2005. The diversity, structure and status of populations. Pp. 99-172 In: (R.N. Williams, ed.) Return to the River, Elsevier Press, St. Louis, MO.

Lichatowich, J.A., M.S. Powell and R.N. Williams 2005. Artificial production and the effects of fish culture on native salmonids. Pp. 417-464 In: (R.N. Williams, ed.) Return to the River, Elsevier Press, St. Louis, MO.

Williams, R.N., J.A. Stanford, J.A. Lichatowich, W.J. Liss, C.C. Coutant, W.E. McConnaha, R.R. Whitney, P.R. Mundy, P.A. Bisson and M.S. Powell 2005. Conclusions and Strategies for Salmon Restoration in the Columbia River. Pp. 629-666 In: (R.N. Williams, ed.) Return to the River, Elsevier Press, St. Louis, MO.



**Government Documents:**

- Kozfkay, C., M. Campbell, A. Boone, and M. Powell. 2007. Genetic analysis of Snake River sockeye salmon (*Oncorhynchus nerka*). Completion Report. Project No. 199009300, Bonneville Power Administration, Portland, OR.
- Stephenson, J., D. Hatch, R. Branstetter, J. Whiteaker, S. Narum, D. Fast, T. Newsome, J. Blodgett, D. Lind, B. Bosch, B. Rogers, M. Johnston, D. Best, J. Lovtang, M. Gauvin and M. Powell. 2007. An evaluation of the reproductive success of natural-origin, hatchery-origin and kelt steelhead in the Columbia Basin. Completion Report, Project No. 2003-062-00, Bonneville Power Administration, Portland, OR.
- Moran, P., M. Banks, T. Beacham, C. Garza, S. Narum, M. Powell, M. Campbell, L. Seeb, R. Wilmot, S. Young, W. Ardren and J. Wenburg. 2005. Interlaboratory standardization of coast-wide Chinook salmon genetic data for international harvest management. Report from the Genetic Analysis of Pacific Salmonids (GAPS) consortium to the Chinook Technical Committee of the Pacific Salmon Commission, Vancouver, B.C.
- Narum, S.R., A. Talbot, D. Hatch, J. Whiteaker and M. Powell. 2005. Three genetic stocks of upriver bright fall Chinook salmon detected in the Columbia River. Pp. 67-69 In: Technical Report #5, Application of stock identification in defining marine distribution and migration of salmon. North Pacific Anadromous Fish Commission, Vancouver, B.C.
- Powell, M.S. and J.C. Faler. 2004. A genetic investigation of redband trout populations in the East Fork Owyhee River drainage with regard to population structure and hatchery rainbow trout introgression Pp.13-23 In: Assess Resident Fish Stocks: Owyhee Subbasin (M. Allen, ed.) Final Report. Bonneville Power Administration, BPA Report DOE/BP-00004019-1
- Berejikian, B., F. Thrower, M. Powell, E. Amman, E.P. Tezak, and T.A. Flagg. 2004. Reintroduction success of steelhead from captive propagation and release strategies. Completion Report. Project No. 22064, Bonneville Power Administration, Portland, OR.
- Faler, J.C. and M.S. Powell. 2003. Genetic analysis of *Oncorhynchus nerka*. Completion Report. Project No. 199009300, 64pp. Bonneville Power Administration, Portland, OR. DOE/BP-12885-3
- Contor, C., A. Sexton, J. Volkman, B. Mahoney, T. Hansen, E. Hoverson, P. Kissner, C. Crump, S. Narum, A. Talbot and M. Powell. 2003. Walla Walla River basin natural production monitoring and evaluation project. 210pp, Bonneville Power Administration, Portland, OR. BPA Report DOE/BP-00013171-1
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- Xuan Qiu, Alejandro Buentello, Richard Clayton, Steven J. Konrady, Allen Pattillo, Madison Powell, D. Allen Davis, and Joseph E. Morris. (*submitted*). The production of novel soy varieties from non-GM cultivars using non-thermal processing methods and their effects on growth performance, immunity and enteric bacteria populations of juvenile Nile tilapia, *Oreochromis niloticus*. *Aquaculture*.

**Professional Meeting Presentations and Posters:***International*

- Powell, M., T. G. Gaylord and W. Sealey. Modified dietary amino acid balance to increase soy protein inclusion in trout feeds and validation of calprotectin as a biomarker of SBM induced enteritis. USSEC Aquaculture Educational Opportunity, Panama City, Panama, Jan 2017 (invited presentation)
- Gatlin, D. M., T. G. Gaylord, W. M. Sealey, M. R. Denson, D. W. Bearden, A. M. Watson, F. T. Barrows, F. Casu, A. Velasquez, T. Kennedy and M. S. Powell. 2016. Comparative dietary soybean meal utilization in rainbow trout, red drum and cobia. International Symposium on the Feeding and Nutrition of Fish, Sun Valley, ID June 2016.
- Powell, M., T. G. Gaylord, W. Sealey, D. Gatlin, M. Denson, A. Watson, D. Bearden, and F. Barrows. 2016. Biomarkers for dietary soybean meal utilization. USSEC Aquaculture Educational Opportunity, Villahermosa, MX, Jan 2016 (invited presentation)
- Powell, M. Nutritional Stress: Acclimation and adaptation in rainbow trout over time using *in vitro* and *in vivo* studies. XIII Simposium Internacional de Nutrición Acuícola, Hermosillo, Sonora, MX, Nov 2015 (invited presentation)
- Powell, M. and Chein-Hsien Kuo. Nutritional stress: adaptations in teleost models over time using *in vitro* and *in vivo* studies. Department of Aquatic Biosciences, National Chiayi University, March 2014 (invited presentation).
- Powell, M., T. Kennedy, J. Faler and R. Hardy. Gene expression in rainbow trout (*Oncorhynchus mykiss*), Nile tilapia (*Oreochromis niloticus*) and white sturgeon (*Acipenser transmontanus*) erythrocytes under differing *in vitro* glycemic conditions. XII Simposio Internacional De Nutricion Acuicola, Villahermosa, MX, Nov. 2013 (invited presentation).

- Cruz-Suarez, L. E., D. Ricque-Marie, B. Patro, M. Powell and R. W. Hardy. Evaluation of *Ulva clathrata* meal supplementation in fish meal vs plant protein-based diets for rainbow trout *Oncorhynchus mykiss*. 21<sup>st</sup> International Seaweed Symposium, Bali, Indonesia, April 2013.
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- Powell, M. Recent molecular advances in dietary carbohydrate utilization in rainbow trout. XI Simposio Internacional De Nutricion Acuicola, Mexico City, MX Nov. 2011 (invited presentation).
- Powell, M. S. Aquaculture Research at the University of Idaho. National Chiayi University, Chiayi Taiwan. May 2008 (invited presentation).
- Powell, M.S., and R.W. Hardy. Comparative body composition of hatchery-produced and wild sockeye salmon *Oncorhynchus nerka* smolts. World Aquaculture Society, Annual Meeting, Florence, Italy, May 2006.
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- Powell, M.S., Genetic detection of IHNV using quantitative PCR. IHNV Research Summit, Campbell River, B.C., Jan. 2003 (invited presentation).
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- Powell, M., K. Overturf, C. Hogge and K. Johnson. Quantitative PCR for the detection of *Renebacterium salmoninarum* in Chinook salmon. Fish Health Section, American Fisheries Society, Victoria, B.C., June 2001.
- Powell, M.S. Conservation aquaculture Landcatch Natural Selection Inc., Stirling, Scotland, Jun. 2001 (invited presentation).
- Powell, M.S. Using individual based assignment tests for broodstock identification. Landcatch Natural Selection Inc., Stirling, Scotland, June 2001 (invited presentation).
- Powell, M.S. Choosing marker loci for stock discrimination based on results from RFLP, microsatellites and sequencing. Coastwide Microsatellite Standardization Working Group meeting, Pacific Salmon Commission, Vancouver, BC. Nov. 2000.
- Anders, P., C. Gelok and M. Powell. Population structure of white sturgeon (*Acipenser transmontanus*) in western North America, based on mitochondrial DNA sequence analysis. White Sturgeon in British Columbia: Local Adaptations and Recovery Planning Workshop, Harrison, BC, Oct. 2000.

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Powell, M. Recent advances in cutthroat trout nutrition. Unites States Trout Farmers, Annual Meeting, Twin Falls, ID, Sep. 2017.

Kennedy, T. S., A. P. Bartlett, J. R. Hawkes, A. D. Gossi, B. C. Small and M. S. Powell. Transcriptomic effects of feeding schedule on rainbow trout (*Oncorhynchus mykiss*) hypothalamic appetite-regulating hormones, intestinal transporters and circadian rhythm-regulating hormones. Aquaculture America, Annual Meeting, San Antonio, TX, Feb. 2017

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Weigel, D. E., P. J. Connolly and M. S. Powell. Migratory *Oncorhynchus mykiss* colonizing a natal stream after barrier removal in the Methow River Basin. Washington Willamette Fisheries Science Review, Portland, OR, Mar. 2017

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Bearden, D. W., F. Casu, C. Yeoman, G. Gaylord, F. Barrows, M. Powell, J. Yost, A. Watson, P. Sandifer and M. R. Denson. NMR-based metabolomics for finfish feed studies. World Aquaculture Triennial Meeting, Las Vegas, NV, Feb. 2016.

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*Amarus*. American Fisheries Society Annual Meeting, Seattle, WA, Sep. 2015.

Powell, M. Nutritional stress: Carbohydrates, acclimation and adaptation in rainbow trout. 35<sup>th</sup> Fish Feeds and Nutrition Workshop, Bozeman, MT, Sep 2015.

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Weigel, D., P. Connolly. and M. Powell. Reproductive contributions from migratory *Oncorhynchus mykiss* colonizing a natal stream after barrier removal. Western Division American Fisheries Society, Annual Meeting, Boise, ID, April 2013.

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- Santin, A.E., M.S. Powell, R.W. Hardy and K.J. Rodnick. Dietary carbohydrate and biomarkers of sustained glycemia in rainbow trout. Annual Meeting of the Society for Integrative and Comparative Biology, Charleston, SC. Jan. 2012.
- Powell, M. Recent molecular advances in dietary carbohydrate utilization in rainbow trout. XI Simposio Internacional De Nutricion Acuicola, Mexico City, MX Nov. 2011 (invited presentation).
- Weigel, D., P. Connolly and M. Powell. Colonization of wild and hatchery steelhead (*Oncorhynchus mykiss*) in a small tributary after barrier removal. Annual Meeting of the American Fisheries Society, Seattle, WA. Sept. 2011.
- Robinson, L., J. Faler and M. Powell. Differential expression of hepatic genes from rainbow trout in a crossover trial using different levels of dietary carbohydrate. Annual Meeting of the Idaho INBRE Fellowship program, Moscow, ID, Aug. 2011.
- Jones, E. S., J. Faler and M. Powell. Dietary carbohydrate acclimation: gene expression following glucose challenge in rainbow trout. Annual Meeting of the Idaho INBRE Fellowship program, Moscow, ID, Aug. 2011.
- Powell, M.S., M.T. Casten, J.C. Faler, B.M. Vaage and R.W. Hardy. Investigation of temporal changes in dietary carbohydrate utilization in rainbow trout. Aquaculture America, Annual Meeting, New Orleans, LA, March 2011.
- LaVelle, J., M. Powell, T. Macbeth, and T. Gendusa. Evaluating variation in gene expression in PCB-exposed and reference wild Rainbow trout. Society of Environmental Toxicology and Chemistry Annual Meeting, Portland, OR, Nov. 2010.
- Anders, P., A. Drauch, B. May, J. Rodzen, M. Powell, and S. Narum. Integrating genetic evaluations into conservation and management of sturgeons: roles, benefits and limitations. World Sturgeon Conservation Society Meeting Missoula, MT. May 2010.
- Powell, M.S., R.W. Hardy, J. McIver, and K.J. Rodnick. Transforming environmental and physiological assessments using fish erythrocyte gene expression to measure responses. NSF-PFI workshop, Washington, DC, April 2010.
- Powell, M.S. Aquaculture Research in the State of Idaho. Magic Valley Lions Club, Twin Falls, ID, April 2010.
- Powell, M.S., G.K. Murdoch, F.T. Barrows and R.W. Hardy. Effects of high and low phosphorous diets on bone and hepatic gene expression in rainbow trout fry, fingerling and post juvenile stages. Aquaculture America, Annual Meeting, San Diego, CA, Feb. 2010.
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Wenatchee, WA, Jan. 2010.

Powell, M.S. Challenges and opportunities for QPCR in fish feeding trials. Fish Feeds and Nutrition Workshop, Twin Falls, ID, Sep. 2009.

Powell, M.S., G.K. Murdoch, F.T. Barrows, M.T. Casten, and R.W. Hardy. Phosphorus metabolism in rainbow trout fry, fingerling and post juvenile stages. Idaho Aquaculture Association, Annual Meeting, Twin Falls, ID, June 2009.

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Sealey, W.M., F.T. Barrows, C.E. Smith, J.M. Wacyk, B.C. Donahower, M.S. Powell, R.W. Hardy, and E.A. Sheldon. Heat shock protein regulation in rainbow trout *Oncorhynchus mykiss* is altered by dietary soybean meal inclusion and anti-phospholipase A2 antibody. Aquaculture America, Annual Meeting, Seattle, WA, Feb. 2009.

Donahower, B.C., S. DuMond, L. Ray, L. Lemon, G. Fornshell, T. Patterson, J. Rockett, M. Powell, W. Sealey. Evaluation of the use of ultrasound to stage mature white sturgeon *Acipenser transmontanus* for caviar production. Aquaculture America, Annual Meeting, Seattle, WA, Feb. 2009.

Chapalamadugu, K., B. Robison, R. Drew, M. Benner, M. Powell, J. Amberg, K. Rodnick, R. Hill, R. Hardy and G. Murdoch. Effect of dietary carbohydrate on myogenic regulatory factor expression in rainbow trout and zebrafish. American Fisheries Society, Annual Meeting, Nashville, TN, Aug. 2009.

Jones, B.S., M.S. Powell, R.E. Drew, G.K. Murdoch, M. Oswald, M.J. Benner and B.D. Robison. Variation in periprandial regulation of neuropeptide genes between behaviorally distinct populations of zebrafish (*Danio rerio*). International Congress on the Biology of Fishes, Portland, OR, July 2008.

Powell, M.S., J. Wacyk, K. Plant, D.A.J. Stone, K.J. Rodnick, B.D. Robison, R.E. Drew, G.K. Murdoch, R.A. Hill, and R.W. Hardy. Expression of glycolytic and gluconeogenic enzymes show intraspecific variation among selected and non-selected strains of rainbow trout fed high levels of dietary carbohydrate. International Congress on the Biology of Fishes, Portland, OR, July 2008.

Robison, B.D., R.E. Drew, G.K. Murdoch, M.S. Powell, K.J. Rodnick, M. Settles, D.A.J. Stone, E. Churchill, R.A. Hill, M.R. Papasani, S.S. Lewis, and R.W. Hardy. Sexual dimorphism in the hepatic transcriptome of zebrafish and the effect of dietary carbohydrates. International Congress on the Biology of Fishes, Portland, OR, July 2008.

Lewis, S.S., B.D. Robison, M.S. Powell, K.J. Rodnick, R.W. Hardy, G.K. Murdoch and R.A. Hill. Chronic dietary carbohydrate composition affects gene expression of some key regulators of metabolism and growth: a study using the zebrafish model. The Endocrine Society Annual Meeting, San Francisco, CA, June 2008.

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Annual Meeting, Moscow, ID, April 2008.

- Wacyk, J., M.S. Powell, G.K. Murdoch, B.D. Robison, K.J. Rodnick, R.A. Hill, and R.W. Hardy. Dietary carbohydrate level affects expression of genes modulating the REDOX status in Rainbow trout liver. NSF-EPSCoR, Annual Meeting, Moscow, ID, April 2008.
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- Amberg, J.J., G.K. Murdoch, B.D. Robison, M.S. Powell, K.J. Rodnick, R.A. Hill, and R.W. Hardy. Dietary carbohydrate level affects expression of the intestinal nutrient transporters and amino acid catabolism in rainbow trout (*Oncorhynchus mykiss*). Aquaculture America, Annual Meeting, Orlando, FL, Feb. 2008.
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- Wayck, J., M. Powell, K. Plant, K. Rodnick, R. Hardy and D. Stone. Comparison of growth and gene expression among rainbow trout (*Oncorhynchus mykiss*) fed different levels of carbohydrates. NSF-EPSCoR, Annual Meeting, Moscow, ID, May 2007.
- Powell, M.S. Trout and salmon in Idaho: past, present and future. Idaho Historical Society, Hagerman, ID, April 2007.
- Powell, M.S., J. Foltz, K.P. Plant, K. Clemons and K. Overturf. Detection of *Nucleospora salmonis* in steelhead, *Oncorhynchus mykiss* (Walbaum), using quantitative polymerase chain reaction (qPCR), World Aquaculture Society, Annual Meeting, San Antonio, TX, March 2007.
- Young, K., E.B. Richards and M.S. Powell. Genetic analysis of Snake River white sturgeon using microsatellites. Annual Meeting, Partners in Science, M.J. Murdock Charitable Trust, San Diego, CA, Jan. 2007.
- Rodnick, K., P. Battiprolu, S. Seiler, A. Goddard, S. St. Hillare, M. Powell and J. Ebersole. Evidence for site differences in sex ratio, swimming performance, morphometrics, and incidence of disease in coho salmon from West Fork Smith River, OR. Oregon Chapter, American Fisheries Society, Annual Meeting, Sun River, OR, March 2006.
- Leth, B. and M. Powell. Reproductive success of hatchery and natural origin Chinook salmon (*Oncorhynchus tshawytscha*) in a stream with a history of supplementation management. Idaho Chapter, American Fisheries Society, Annual Meeting, Idaho Falls, ID, Feb. 2006. (awarded best professional paper)
- Narum, S., D. Hatch, A. Talbot, P. Moran, and M.S. Powell. Origin of iteroparus steelhead from populations in the Snake River. Idaho Chapter, American Fisheries Society, Annual Meeting, Idaho Falls, ID, Feb. 2006.
- Powell, M.S., Closing the gap: A genetic perspective on the future of hatcheries and conservation. Practical Paths to Salmon Recovery, Part II, Idaho Council for Industry and the Environment, Boise, ID, Oct. 2005 (invited presentation).

- Powell, M.S. and R.W. Hardy. Opportunities for research collaborations using fish and University of Idaho, Hagerman assets. Report to the State of Idaho Joint Senate and House of Representatives Biotechnology Task Force, State Capitol, Boise ID, Sep. 2005 (invited presentation).
- Powell, M.S., V. Paragamian, J. Dunnigan, and P. Anders. Vicariance and dispersal among Pacific Northwest populations of burbot. American Fisheries Society, Annual Meeting, Anchorage, AK, Aug. 2005.
- Willard, C., M. Powell and J. Faler. Utilizing parental exclusion analysis to evaluate smolt production from the Snake River sockeye salmon broodstock program. American Fisheries Society, Annual Meeting, Anchorage, AK, Aug. 2005.
- Stephenson, J., R. Orme, S. Narum, and M. Powell. Limitations of genetic data to detect demographic bottlenecks in metapopulations of Chinook salmon. American Fisheries Society, Annual Meeting, Anchorage, AK, Aug. 2005.
- Leth, B., S. Sharr, J. Lutch, and M. Powell. Reproductive success of hatchery and natural origin Chinook salmon in a stream with a history of supplementation management. American Fisheries Society, Annual Meeting, Anchorage, AK, Aug. 2005.
- Cegelski, C.C., M.R. Campbell, K.A. Meyer and M.S. Powell. Evaluating genetic structure of interior redband trout in environmental extremes of Idaho using microsatellite loci. American Fisheries Society Annual Meeting, Anchorage, AK, Aug. 2005.
- Narum, S.R., R. Evenson, B. Sharp, A. Talbot and M.S. Powell. Microsatellites reveal maintenance of genetic structure between native and introduced steelhead trout in the Klickitat River. American Fisheries Society, Annual Meeting, Anchorage, AK, Aug. 2005.
- Cegelski, C.C., M.R. Campbell, K.A. Meyers and M. Powell. Large scale and fine scale genetic structuring of Yellowstone cutthroat trout (*Oncorhynchus clarki bouvieri*) in Idaho. Idaho Chapter, American Fisheries Society, Annual Meeting, Boise, ID, Feb. 2005.
- Campbell, M.R. C.C. Cegelski, J. Chatel, D. Mahoney, D. Zaroban, and M. Powell. Mitochondrial DNA analysis of Wood River sculpin *Cottus leiopomus* from the Big Wood, Little Wood and Camus Drainages in Idaho. Idaho Chapter, American Fisheries Society, Annual Meeting, Boise, ID, Feb. 2005.
- Narum, S.R., S. Boe, M. Paquin, P. Moran, and M. Powell. Genetic variation in steelhead trout of the Grande Ronde River, Idaho Chapter, American Fisheries Society Annual Meeting, Boise, ID, Feb. 2005.
- Powell, M.S., P. Kline, and R.W. Hardy. Comparison of proximate composition of hatchery-reared juvenile sockeye salmon *Oncorhynchus nerka* in Idaho, Aquaculture America, New Orleans, LA, Jan. 2005.
- Flagg, T., C. McAuley, P. Kline, M. Powell, D. Taki, and J. Gislason. Enhancement of ESA-listed endangered Redfish Lake sockeye salmon via a captive broodstock program. Aquaculture America, New Orleans, LA, Jan. 2005.
- Richards, E.B., and M.S. Powell. Molecular markers for the discrimination of lamprey species. Annual Meeting, Partners in Science, M. J. Murdock Charitable Trust, San Diego, CA, Jan. 2005.
- Powell, M.S., C.C. Cegelski, M.R. Campbell, R. Wilkinson, and S. Brink. Comparative assessment of micro-scale genetic risks in a native trout population: Conflict between long-term conservation goals. Society for Conservation Biology, Annual Meeting, New York, NY, Aug. 2004.

- Cegelski, C.C., M.R. Campbell and M.S. Powell. Efficacy of a Bayesian approach for detecting hybridization between westslope and rainbow trout: comparing microsatellite and RFLP data. Society for Conservation Biology, Annual Meeting, New York, NY, Aug. 2004.
- Cegelski, C.C., M.R. Campbell, M.S. Powell and K. Meyer. Evaluating genetic diversity and population genetic structure of Yellowstone cutthroat trout using microsatellite loci. Western Division, American Fisheries Society, Salt Lake City, UT, Jul. 2004 and American Fisheries Society, Annual Meeting, Madison, WI, Aug. 2004.
- Campbell, M.R., C.C. Cegelski, K.A. Meyer and M.S. Powell. Mitochondrial DNA variation and distribution in Yellowstone cutthroat trout *Oncorhynchus clarki bouvieri* across its native range: Implications for management and conservation. Idaho Chapter, American Fisheries Society Annual Meeting, Moscow, ID, Feb. 2004, Western Division, AFS, Salt Lake City, UT, Jul. 2004 and American Fisheries Society, Annual Meeting, Madison, WI, Aug. 2004.
- Dresser, T. J., M. Powell, J. Faler, M. Campbell. Genetic analysis of redband / rainbow trout from tributaries within the Priest Rapids project area, Mid-Columbia River, Washington, USA. Northwest Scientific Association, Annual Meeting, Ellensburg, WA, Mar. 2004.
- Narum, S.R., A. Talbot and M.S. Powell. Coastwide standardization of Chinook salmon genetic data. Idaho Chapter, American Fisheries Society, Annual Meeting, Moscow, ID, Feb. 2004.
- Cegelski, C.C., M.R. Campbell, M.S. Powell, K. Meyer and D. Teuscher. An assessment of introgressive hybridization between Yellowstone cutthroat trout and introduced rainbow trout in the Snake River basin: conservation and management implications. Idaho Chapter, American Fisheries Society, Annual Meeting, Moscow, ID, Feb. 2004.
- Cegelski, C.C., M.S. Powell, M.R. Campbell, R. Wilkinson and S. Brink. Population structure and intraspecific hybridization of *O. mykiss* in the Malad River, Idaho. Idaho Chapter, American Fisheries Society, Annual Meeting, Moscow, ID, Feb. 2004.
- Powell, M.S., R. Williams, J. Lichatowich and P. Mundy. A blueprint for hatchery reform in the 21st century: The landscape approach. Magic Valley Fish Fishers, Twin Falls, ID, Jan. 2004.
- Narum, S.R., A. Talbot and M.S. Powell. Hybridization of ocean and stream-type Chinook salmon in a reintroduced fishery in Clearwater River, Idaho. American Fisheries Society, Annual Meeting, Quebec, Canada, Aug. 2003.
- Powell, M.S., P.A. Kline and T. Flagg. Application of captive broodstocks to preservation of ESA-listed stocks of Pacific Salmon: Redfish Lake sockeye salmon case example. Propagated Fish in Resource Management. Special Symposium, American Fisheries Society, Boise, ID, June 2003.
- Campbell, M.R., C.C. Cegelski and M.S. Powell. Assessment of introgressive hybridization between westslope cutthroat trout and native rainbow trout in the Middle Fork Salmon River, ID: conservation and management implications, Propagated Fish in Resource Management, Special Symposium, American Fisheries Society, Boise, ID, June 2003.
- Flagg, T.A., C.W. McAuley, P. K. Kline, M.S. Powell, D. Taki, J.C. Gislason. Application of captive broodstocks for preservation of ESA-listed stocks of endangered Redfish Lake sockeye salmon. Western Division, American Fisheries Society, Annual Meeting, San Diego, CA, April 2003.
- Powell, M.S., Advances in Molecular Genetics; Advances in molecular genetics: addressing old questions and solving new problems. Idaho Chapter, American Fisheries Society, Annual Meeting, Boise, ID, Feb. 2003 (Plenary speaker).

- Campbell, M.R., C. Cegelski, M.P. Peterson and M.S. Powell. An assessment of introgressive hybridization between westslope cutthroat trout and both native and introduced trout in the Middle Fork Salmon River, ID: conservation and management implications. Idaho Chapter, American Fisheries Society, Annual Meeting, Boise, ID, Feb. 2003.
- Narum S., J. Vogel, A. Talbot and M. Powell. No genetic divergence detected between pre- and post-supplemented Chinook salmon spawning aggregates in Johnson Creek. Idaho Chapter, American Fisheries Society, Annual Meeting, Boise, ID, Feb. 2003.
- Powell, M.S. Molecular genetic approaches in fisheries common to both commercial and conservation applications. Department of Animal and Veterinary Sciences and Department of Fish and Wildlife Resources, University of Idaho, Dec. 2002.
- Powell, M.S. and P. Anders. Genetic status of white sturgeon populations in the Snake River. White Sturgeon Status and Recovery Symposium, Idaho Power Company, Boise, ID. Aug. 2002.
- Powell, M., K. Overturf and K. Johnson. Implications to the management of disease in salmonids: Using quantitative PCR for the detection of IHNV and BKD. Western Division Fish Disease section, American Fisheries Society, Corvallis, OR, June 2002.
- Powell, M.S. and P. Kline. Examples of genetic management in captive populations: Redfish Lake sockeye and Salmon River chinook salmon. Captive Broodstocks for Recovery of Imperiled Salmon Populations, Pacific Aquaculture Caucus, Gig Harbor, WA, June 2002.
- Powell, M.S. Multiplex microsatellite analysis of Chinook salmon populations and individual based assignment tests. Applied Biosystems Genetic Analysis User's Meeting, Seattle, WA, March 2002 (invited presentation).
- Powell, M.S., R.N. Williams, S.D. Pavlov, and D.S. Proebstel. Molecular genetic variation among rainbow trout *Oncorhynchus mykiss* Walbaum (Salmonidae, Salmoniformes) from the Kamchatka Peninsula. Idaho Chapter, American Fisheries Society, Annual Meeting, Pocatello, ID, Feb. 2002.
- Powell, M.S. Uses of quantitative PCR for the detection of disease in salmonids. Applied Biosystems, Western Fish Disease Center, Seattle, WA, Nov. 2001 (invited presentation).
- Powell, M. Genetic aspects of Redfish Lake sockeye salmon recovery. Fish and Wildlife 501 guest lecture, Fish and Wildlife Resources, University of Idaho, Moscow, ID, Oct. 2001.
- Powell, M.S., K. Overturf, C. Hogge, and K. Johnson. Quantitative detection of *Renebacterium salmoninarum* in Chinook salmon: refining broodstock segregation. Pacific Region Fisheries Program, USFWS, Hatchery Management Workshop, Richland, WA, Oct. 2001.
- Powell, M.S., R.N. Williams and J.C. Faler. Phylogeographic distributions of redband trout in Idaho and Oregon using mitochondrial DNA. American Fisheries Society Annual Meeting, Phoenix, AZ, Aug. 2001.
- Powell, M.S. Sockeye salmon and Chinook salmon conservation in Idaho. Presentation to university and state liaisons at Ground Zero: Natural Resource Issues in the West, Stanley, ID, Aug. 2001 (invited presentation).
- Powell, M.S. and P.J. Anders. Genetic assessment of Columbia Basin/Snake River white sturgeon. Aquatics Resource Work Group Meeting, Idaho Department of Fish and Game, Boise, ID, May 2001.
- Powell, M.S., R.N. Williams, and M.R. Campbell. Phylogenetic distributions of redband trout in Idaho and Oregon using mitochondrial DNA, Oregon Chapter, American Fisheries Society, Annual Meeting, Portland, OR, Feb. 2001.

- Powell, M.S. Genetics: the value and limitations of this interdisciplinary approach. Idaho Chapter, American Fisheries Society, Annual Meeting, Boise, ID, Feb. 2001 (Plenary speaker).
- Powell, M.S., K. Overturf and K. Johnson. Implications of the management of disease in salmonids: using quantitative PCR for the detection of IHNV and BKD. Idaho Chapter, American Fisheries Society, Annual Meeting, Boise, ID, Feb. 2001.
- Williams, R.N., M. Campbell and M. Powell. Yellowstone cutthroat trout in the upper Snake River basin: defining management units and the extent of introgression with non-native salmonids. Idaho Chapter, American Fisheries Society, Annual Meeting, Boise, ID, Feb. 2001.
- Anders, P. C. Gelok, and M. Powell. Population structure and mitochondrial DNA (mtDNA) diversity of North American white sturgeon (*Acipenser transmontanus*). Idaho Chapter, American Fisheries Society, Annual Meeting, Boise, ID, Feb. 2001.
- Powell, M.S. Pacific salmon conservation in Idaho. Magic Valley Fly Fishers, Twin Falls, ID, Nov. 2000.
- Powell, M.S. Genetic techniques for differentiating among fish stocks. 22<sup>nd</sup> Smolt Workshop, USGS, Boise, ID, Oct. 2000.
- Powell, M.S. Using real-time genetic information for the survival and recovery of threatened and endangered fish populations. Department of Fish and Wildlife Resources, seminar. University of Idaho, Moscow, ID, Oct. 2000.
- Campbell M., M.S. Powell and J. Dillon. Hybridization and introgression in a managed Yellowstone cutthroat trout *Oncorhynchus clarki bowieri* population, Henry's Lake, Idaho: genetic detection and conservation implications. American Fisheries Society, Annual Meeting, St. Louis, MO, Aug. 2000.
- Anders, P.J., D.L. Richards, and M.S. Powell. The first endangered white sturgeon population (*Acipenser transmontanus*): repercussions in an altered large river-floodplain ecosystem. American Fisheries Society, Annual Meeting, St. Louis, MO, Aug. 2000.
- Williams, R.N., and M.S. Powell. Yellowstone cutthroat trout in the upper Snake River basin: defining management units and the extent of introgression with non-native salmonids. American Fisheries Society sponsored symposium on "The Detection, Status, and Management of Introgressed Populations of Cutthroat," Boise, ID, May 2000.
- Powell, M.S. Methodologies for the detection and interpretation of introgressive hybridization among cutthroat trout. American Fisheries Society sponsored symposium on "The Detection, Status, and Management of Introgressed Populations of Cutthroat," Boise, ID, May 2000.
- Campbell M. and M.S. Powell. Genetic analysis of introgressive hybridization between rainbow trout and Yellowstone cutthroat trout in Henry's Lake, Idaho. American Fisheries Society sponsored symposium on "The Detection, Status, and Management of Introgressed Populations of Cutthroat," Boise, ID, May 2000.
- Powell, M.S. Maximizing the benefits of hatchery programs: Applying conservation genetics to fish culture, Symposium on Hatchery Reform, National Aquaculture Association and the Fish Culture Section, American Fisheries Society, Annual Meeting, New Orleans, LA, Jan. 2000.
- Campbell, M.R., M.S. Powell, R.N. Williams and J.C. Dillon. Introgressive hybridization among Yellowstone cutthroat trout and rainbow trout in Henry's Lake, Idaho, The Role of Hybridization in the Distribution, Conservation and Management of Aquatic Species Symposium, American Fisheries Society, Annual Meeting, Charlotte, NC, Aug. 1999.

- Powell, M.S. and P.J. Anders. Phylogeographic distribution of white sturgeon mtDNA haplotypes in the Columbia River Basin: Preliminary results. White Sturgeon Symposium, Western Division, American Fisheries Society, Annual Meeting, Moscow, ID, Jul. 1999 (co-chairman of symposium).
- Powell, M.S. and P. J. Anders. Genetic analysis of Columbia River white sturgeon. USFWS, Abernathy Fish Technology Center, Abernathy, WA, May 1999.
- Powell, M.S. and E.L. Brannon. Snake River Chinook Salmon: Should we conserve genetic entities or evolutionary processes? Idaho Chapter, American Fisheries Society, Annual Meeting, Boise, ID, March 1999.
- Faler, J., P. Kline, K. Johnson, J. Heindel, and M. Powell. Maintaining genetic diversity in East Fork Salmon River Chinook salmon using a spawning matrix. Pacific Northwest Fish Culture Conference, Annual Meeting, Boise, ID, Dec. 1998.
- Powell, M.S., V.L. Paragamian and J.C. Faler. Genetic characteristics of burbot in the Kootenai River drainage of Montana, Idaho, and British Columbia. Burbot Symposium, International Congress on the Biology of Fish, Towson, MD, July 1998.
- Powell, M.S. Application of molecular biology techniques to rainbow trout aquaculture, Idaho Aquaculture Association, Annual Meeting, Twin Falls, ID, June 1998.
- Anders, P. and M. Powell. Karyotypic analysis of endangered Kootenai River white sturgeon (*Acipenser transmontanus*). Idaho Chapter, American Fisheries Society, Annual Meeting, Idaho Falls, ID, Feb. 1998.
- Powell, M., E. Brannon, D. Campton and P. Anders. Assessing genetic variation among Columbia Basin white sturgeon (*Acipenser transmontanus*). Idaho Chapter, American Fisheries Society, Annual Meeting, Idaho Falls, ID, Feb. 1998.
- Casten, M.T., R.W. Hardy, S.E. LaPatra and M.S. Powell. Performance of five rainbow trout (*Oncorhynchus mykiss*) strains at two feeding levels. World Aquaculture Society, Annual Meeting, Las Vegas, NV, Jan. 1998.
- Powell, M.S., M.R. Campbell, J.C. Faler and E.L. Brannon. Life history and genetic analysis of Redfish Lake sockeye salmon. Columbia River Basin Fish and Wildlife Program Review; Bonneville Power Administration, Portland, OR, March 1997.
- Powell, M.S., M.R. Campbell, J.C. Faler and E.L. Brannon. Genetic analysis of Redfish Lake sockeye salmon using mtDNA-RFLPs. NMFS/NOAA Salmonid DNA symposium; NMFS Pacific Northwest Science Center, Seattle, WA, March 1997.
- Powell, M.S., R.N. Williams, B.D. Robison, J.C. Faler, A.L. Setter and E.L. Brannon. Using mitochondrial RFLP analysis to describe phylogeographic patterns among endangered sockeye salmon (*Oncorhynchus nerka*) populations. Society for Conservation Biology, Annual Meeting, Providence, RI, Aug. 1996.

**Patents:**

- Powell, M. S. and K. Overturf. 2004. Quantitative DNA probe and primer set for the detection of *Renebacterium salmoninarum*. U. S. Patent 6733976B2, United States Patent Office.

**Grants and Contracts:****Funded:**

- Powell, M.S., A. Bockus, G. T. Gaylord and W. M. Sealey. Exploring the use of trimethylamine

oxide as a feed additive to combat soy-induced enteritis in farmed rainbow trout. Soy Aquaculture Alliance (US Soybean Board) \$73,065, Oct. 2017-Sep. 2018.

Powell, M.S., G. T. Gaylord, W. M. Sealey and B.C. Small. Evaluation of the Nutritional Value of International Soybean Meal Supplies in multiple Aquaculture Species Soy Aquaculture Alliance (US Soybean Board) \$26,493, Oct. 2017-Sep. 2018.

Powell, M.S., G.T. Gaylord, W.M. Sealey, and K. Overturf. Comparing Selected vs. Non-Selected Rainbow Trout to Elucidate Resistance to Soybean Meal Caused Distal Enteritis. Soy Aquaculture Alliance (US Soybean Board) \$68,755, Oct. 2016-Sep. 2017.

Powell, M.S., G.T. Gaylord and W.M. Sealey. Modified dietary amino acid balance to increase soy protein inclusion in trout feeds and validation of calprotectin as a biomarker of SBM induced intestinal injury. Soy Aquaculture Alliance (US Soybean Board). \$78,172, Mar. 2016 – Feb. 2017.

Myrick, C., M. Powell, B. Patro, W. Sealey and G. Fornshell. If you feed them, will they grow? A dietary approach to improving the growth of juvenile cutthroat trout. Western Regional Aquaculture Center (USDA-NIFA), Jul. 2013-Jun. 2018, \$228,724 (of \$357,391 total).

Powell, M. Hagerman Fish Genetics Contract, Columbia River Inter-Tribal Fish Commission. \$1,678,137, Jan 2016 – Dec 2016.

Powell, M. Hagerman Fish Genetics Contract, Columbia River Inter-Tribal Fish Commission. \$1,240,464, Jan 2015 – Dec 2015.

Powell, M.S. Comparative microbiota analysis among salmon, yellowtail and tilapia. Schillinger Genetics, Aug. 2014-Dec. 2015, \$8,280.00

Powell, M., W. Sealey, G. Gaylord, D. Gatlin, F. Barrows, M. Denson and D. Bearden. Determination and validation of transcriptomic and metabolite biomarkers for dietary soybean meal utilization Soy Aquaculture Alliance (United Soybean Board), Aug. 2014 – Dec. 2015, \$150,000.

Powell, M.S., Genetic analyses for collaborative studies. Columbia River Inter-Tribal Fish Commission, Jan. 2013–Dec. 2014, \$1,955,412.

Hardy, R.W., K.A. Overturf, S.R. Narum, M.S. Powell and P. Rezamand. Genomic and physiological assessment to identify changes allowing high-soy use in genetically-improved line of rainbow trout: breaking the 20% soy protein barrier in feeds for marine fish. Soy Aquaculture Alliance (United Soybean Board), Oct. 2012-Sep. 2013, \$7,722 (of \$152,954 total).

Hardy, R.W., K.A. Rodnick and M.S. Powell. Novel, non-lethal approaches to assess physiological wellness in ornamental fish. Waltham Foundation (Waltham Centre for Pet Nutrition), Jul. 2012-Nov. 2014, \$7,345 (of \$19,994 total).

Powell, M.S., Investigation of temporal changes in dietary carbohydrate utilization in rainbow trout, USDA-AFRI Animal Growth and Nutrition, June 2010 – May 2013, \$134,079.

Powell, M.S., Genetic analyses for collaborative studies. Columbia River Inter-Tribal Fish Commission, Jan. 2011 – Dec. 2012, \$2,445,868.

Powell, M.S., Analysis of trout in contaminated streams using microarrays. CDM Smith Inc., Dec. 2011-July 2013, \$7,700.00.

Powell, M.S. SGP: African Cichlid, University of Idaho Student Grant Proposal, \$3,397. July 2011.

Powell, M.S., Genetic analyses for collaborative studies. Columbia River Inter-Tribal Fish

Commission, March 2010 – Dec. 2010, \$500,000.

- Powell, M.S., and G. Murdoch. Determining size effects on phosphorus uptake, skeletal mineralization and phosphorus metabolism in rainbow trout. WSU/UI Aquaculture Initiative (USDA-CSREES), June 2009 – June 2010, \$20,000.
- Powell, M.S., Genetic analyses for collaborative studies. Columbia River Inter-Tribal Fish Commission, Jan. 2009 – Dec. 2009, \$604,552.
- Powell, M.S., Salaries for collaborative studies. Columbia River Inter-Tribal Fish Commission, Jan. 2009 – Dec. 2009, \$271,088.
- Powell, M., W. Sealey, T. Patterson, and G. Fornshell. Ultrasound for determination of sex in white sturgeon (*Acipenser transmontanus*). WSU/UI Aquaculture Initiative (USDA/CSREES), funding approved June 2009 – June 2010, \$15,000.
- Powell, M.S. Salaries for collaborative studies. Idaho Department of Fish and Game, June 2007 – June 2008, \$34,000.
- Powell, M.S. Microarray analysis of Redfish lake sockeye salmon. National Marine Fisheries Service, NOAA, June 2007 – Nov. 2007, \$24,754.
- Sealey, W. and M. Powell. Assessing dietary-induced changes among trout intestinal microflora: the appealing simplicity and growing importance of T-RFLP analyses. WSU/UI Aquaculture Initiative (USDA/CSREES), Sep. 2006 – Sep. 2008, \$6,890 (of \$13,780 total).
- Powell, M.S. Lower Methow River fisheries population analysis. Bureau of Reclamation. U.S. Department of Interior, June 2006 – Dec. 2010, \$172,445.
- Powell, M.S., Genetic analysis of Snake River sockeye salmon (*Oncorhynchus nerka*). Bonneville Power Administration, June 2006 – June 2007, \$98,000.
- Powell, M.S. and K. Young. Assessing genetic variation among populations of white sturgeon in the Snake River Basin. Partner's in Science, M.J. Murdock Charitable Trust, Feb. 2006 – Mar. 2008, \$14,000.
- Powell, M.S. Development of QPCR for *Nucleospora salmonis*. US Fish and Wildlife Service, July 2005 – Dec. 2005, \$4,986.
- Hill, R., M. Powell, B. Robison, K. Rodnick and R. Hardy. Fish physiology and genomics section of the Idaho EPSCoR Grand Challenge Initiative. National Science Foundation, June 2005 – May 2008, \$298,323 (of \$1.5M total).
- Powell, M.S., Genetic analyses (supplies). Columbia River Inter-Tribal Fish Commission, Jan. 2005 – Dec. 2010, \$409,556.
- Powell, M.S., Salaries for collaborative studies. Columbia River Inter-Tribal Fish Commission, Jan. 2005 – Dec. 2010, \$193,500.
- Powell, M.S. Burbot genetic analyses. Montana Department of Fish Wildlife and Parks, Sep. 2004 – May 2005, \$10,575.
- Powell, M.S., J.C. Faler and R. Schrock. Hatchery Chinook salmon genetic analyses from different water sources. US Geological Survey, Sep. 2004 – Dec. 2004, \$20,000.
- Powell, M.S. Kokanee genetic analysis in Kootenay Lake, B.C. Freshwater Fisheries Society of B.C., Aug. 2004 – Dec. 2004, \$13,050.



- Powell, M.S., and D.L. Smith. ICOR engineered streams, Phase V. Interagency for Outdoor Recreation (Washington), Apr. 2004 – Jun. 2006, \$110,077.
- Powell, M.S. and E.B. Richards. Genetic analysis of Pacific Lamprey. Partner's in Science, M.J. Murdock Charitable Trust, Feb. 2004 – Feb. 2006, \$14,000.
- Powell, M.S., and D.L. Smith. Hatchery vs. wild interaction in salmonids. US Fish and Wildlife Service, Sep. 2002 – Sep. 2003, \$92,000.
- Powell, M.S. Salaries for collaborative studies. Idaho Department of Fish and Game, June 2003 – June 2007, \$191,215.
- Powell, M.S., and D.L. Smith. ICOR engineered streams, Phase IV. Interagency for Outdoor Recreation (Washington), June 2003 – June 2006, \$30,464.
- Powell, M.S., Salaries for collaborative studies. Columbia River Inter-Tribal Fish Commission, March 2003 – Dec. 2004, \$62,518.
- Powell, M.S., Genetic analyses (supplies). Columbia River Inter-Tribal Fish Commission, March 2003 – Dec. 2004, \$197,743.
- Powell, M.S., P.J. Anders and G.A Thorgaard, Identification of age-independent, sex specific molecular markers in white sturgeon. WSU/UI Aquaculture Initiative (USDA/CSREES), Sep. 2002 – Sep. 2003, \$30,000.
- Berejikian, B, T.A. Flagg, and M.S. Powell, Sashin Creek Steelhead reproductive success. Bonneville Power Administration, Aug. 2002 – Sep. 2003, \$55,725 (of \$262,000 total).
- Powell, M.S. Assessment of genetic population structure and risk of introgression and hybridization to native westslope cutthroat trout in the Middle Fork Salmon River Drainage. Idaho Department of Fish and Game, May 2002 – June 2003, \$51,300.
- Powell, M.S., and D.L. Smith. ICOR engineered streams, Phase III. Interagency for Outdoor Recreation (Washington), April 2002 – June 2004, \$34,816.
- Powell, M.S. Genetic investigation of rainbow trout samples from the Big Wood and Little Wood Rivers. Sawtooth National Forest, USFS, Jan. 2002 – Dec. 2003, \$14,137.
- Powell, M.S. Genetic analysis of intraspecific hybridization between coastal and redband trout on the Colville Reservation. Colville Confederated Tribes, Dec. 2001 - Dec. 2002, \$4,000.
- Powell, M.S. Genetic analysis of redband trout. Shoshone-Paiute Tribe. Sep. 2001 – Aug. 2003, \$43,611.
- Powell, M.S. and E. R. Keeley. Genetic and morphometric analysis of temperature tolerant redband trout (*Oncorhynchus mykiss*) from Southeast Oregon. Malheur National Wildlife Refuge, USFWS, Feb. 2001 \$6,015 (of \$12,000 total).
- Hatch, C.R., E.L. Brannon, R.W. Hardy, and M.S. Powell, OIA Partnerships for Innovation – PFI, National Science Foundation, Oct. 2000 – Sep. 2003, \$56,212 (of \$564,709 total).
- Powell, M.S. Genetic analyses of Walla Walla River steelhead. Columbia River Inter-Tribal Fish Commission, May 2000 – July 2000, \$50,962.
- Powell, M.S. Rainbow trout / steelhead genetic analysis. Public Utility District #2 of Grant County, WA, Jan. 2000 – Feb. 2002, \$15,200.
- Powell, M.S. Genetic analysis of Idaho Yellowstone cutthroat trout. Idaho Department of Fish and

Game, Jan. 2000 – Mar. 2000, \$16,666.

Powell, M.S. and E.L. Brannon. Assessing genetic variation among Columbia Basin white sturgeon populations. Bonneville Power Administration, Nov. 1999 – Oct. 2002, \$393,200.

Hardy, R.W. and M.S. Powell. Effects of selenium exposure on cutthroat trout (*Oncorhynchus clarki*). Montgomery Watson. May 1999 – April 2000, \$4,600 (of \$67,385).

Powell, M.S. Deschutes River Fall Chinook DNA sample analysis. Confederated Tribes of the Warm Springs Reservation, April 1999 - May 1999, \$14,385.

Powell, M.S., Genetic analysis of Snake River sockeye salmon (*Oncorhynchus nerka*). Bonneville Power Administration, Jan. 1999 – Dec. 2003, \$423,397.

Powell, M.S. Genetic analysis of rainbow/redband trout in the Coeur d' Alene River. Idaho Department of Fish and Game, Oct. 1998, \$720.

Powell, M.S. DNA analysis of Teton Creek cutthroat. Henry's Fork Foundation, Sep. 1998, \$1,496.

Powell, M.S. Genetic determination of Pacific lamprey. US Geological Survey, Biological Resources Division, Sep. 1998, \$978.

Brannon, E.L., M.S. Powell, T.P. Quinn, and A. Talbot. Columbia River Chinook salmon and steelhead population structure. Bonneville Power Administration, Aug. 1998 – April 2000, \$52,000 (of \$99,949 total).

Powell, M.S. and J.C. Faler. Breeding matrix for East Fork Salmon River Chinook salmon. Idaho Department of Fish and Game, July 1998 – Aug. 1998, \$8,000.

Powell, M.S. White sturgeon restoration. Oregon Department of Fish and Wildlife, Jun. 1998 – Sep. 1998, \$38,000.

Powell, M.S. Mitochondrial and nuclear DNA analysis of Salmon River Chinook salmon. Nez Perce Tribe, May 1998 – April 1999, \$4,864.

Powell, M.S. Genetic analysis of Pacific lamprey in the Columbia River. Columbia River Inter-Tribal Fish Commission, May 1998 – Dec. 1998, \$6,420.

Williams, R.N. and M.S. Powell. Genetic diversity of redband trout from Owyhee mountain streams, Bureau of Land Management, Feb. 1998 – Dec. 1998, \$5,000 (of \$5,000 total).

Williams, R.N. and M.S. Powell. Genetic analysis of rainbow trout from Silver Creek, Idaho. The Nature Conservancy, Feb. 1998 – Oct. 1998, \$6,000 (of \$6,000 total).

Powell, M.S., Genetic analysis of Snake River sockeye salmon (*Oncorhynchus nerka*). Bonneville Power Administration, Jan. 1998 - Dec. 1998, \$151,148.

Powell, M.S., Genetic analysis of Cyprinidae from the Columbia River. US Geological Survey, Jan. 1998 – Sep. 1998, \$2,000.

Powell, M.S., Genetic analysis of Yaak River rainbow trout. Montana Department of Fish Wildlife and Parks, Jan. 1998 – Aug. 1998, \$1,850.

Brannon, E.L. and M.S. Powell. Life history and genetic analysis of *Oncorhynchus nerka*. Bonneville Power Administration, Nov. 1996 - Oct. 1997, \$130,900 (of \$134,100 total) .

Brannon, E.L., R.W. Hardy, J.G. Cloud and M.S. Powell, Salmonid and freshwater fish research laboratory. National Science Foundation - EPSCoR, July 1996 – Jun. 1998, \$177,635 (of

\$494,141 total).

Brannon, E.L. and M.S. Powell. Life history and genetic analysis of *Oncorhynchus nerka*. Bonneville Power Administration, Nov. 1995-Oct. 1996, \$120,000 (of \$125,000 total).

Powell, M.S. and R.N. Williams. Genetic analysis of Nevada redband, Lahontan cutthroat and Humboldt cutthroat trout. Nevada Department of Wildlife, July 1995 – July 1997, \$61,000.

**Unfunded:**

Ramsay, S., A. Roe, C. Vella, M. Powell and K. Overturf. Increasing trout consumption in young children and families and evidence of inflammatory and cognitive benefit USDA-NIFA, Jan. 2018-Dec. 2021, \$497,900.

Powell, M., G. Gaylord and W. Sealey. Alterations in ideal amino acid balance in rainbow trout to support optimized efficiency and health, USDA-NIFA, July 2016, \$451,094

Powell, M., G. Gaylord and W. Sealey. Evaluation of alternative protein-based feeds on rainbow trout gastric inflammation, waste production and feed efficiency, USDA-NIFA, May 2015, \$397,568

Powell, M.S., W. Sealey, G. Gaylord and G. Fornshell. Evaluation of dietary inclusion of soybean components and alternate proteins on gastric enteritis in rainbow trout aquaculture, USDA-NIFA, May 2014, \$409,714 total.

Sealey, W., M. Powell, G. Knapp, F. Barrows and G. Fornshell. Enhancing growth and health of trout and tilapia through prebiotic supplementation in extruded feeds, Western Regional Aquaculture Center (USDA-NIFA) July 2014, \$88,481 (of \$274,334 total).

Powell, M., K. Rodnick, and R. Hardy. Glucose homeostasis in carbohydrate intolerant teleosts. NSF – Integrated Organismal Systems, preproposal. Jan. 2013.

Powell, M., K. Overturf and G. Fornshell. Evaluation of a new method for determining the sex of white sturgeon from plasma samples. Western Regional Aquaculture Center (USDA) \$20,000 Oct. 2012.

Powell, M., K. Rodnick, and R. Hardy. Temporal regulation of plasma glucose in a carbohydrate intolerant teleost. NSF – Integrated Organismal Systems, preproposal. Jan. 2012.

Barnes S., L. Ray, and M. Powell. Enhancing male to female ratio for commercial cichlid culture USDA-SBIR \$15,233 (of \$70,000). Sep 2010.

Powell, M.S., K.E. Overturf, K.J. Rodnick, and R.W. Hardy. Nutrient Regulated Gene Expression. IBEST Sequencing and Analysis Pilot Project Preproposal. May 2009

Hardy, R.W., G. Murdoch, K. Cain, Powell, M.S. and K.J. Rodnick. Transforming Technology to Assess Fitness of Hatchery-Reared Pacific Salmon and Steelhead Trout to Increase Survival and Restore Populations. Keck Foundation Preproposal. Aug. 2009

Powell, M.S. Investigation of temporal changes in dietary carbohydrate utilization in rainbow trout. USDA -ARFI \$137,829 July 2009.

Powell, M.S., R.W. Hardy and W.M. Sealey. Transcriptional response to glycolytic stress in carnivorous fish. NSF - Integrated Organismal Systems, proposal \$131,048, Jul 2008

Powell, M.S. W. Sealey and R.W. Hardy. Optimizing dietary carbohydrate for maximal protein retention and growth in rainbow trout. USDA-CSREES, proposal \$170,718, May 2008.

- Powell, M.S., R.W. Hardy, P. Kline and T. Flagg. Assessment of Functional Biological Differences Between Natural and Hatchery-Raised Redfish Lake Sockeye Salmon. Innovative Project Solicitation, Bonneville Power Administration, Jun. 2007, \$199,751
- Foltz, J. and M. Powell. University of Idaho Science Symposium. Keck Foundation Preproposal. Jun. 2007
- Flagg, T., D. Maynard, R. Hardy, M. Powell, P. Kline and P. Seidel. Regional Assessment of functional biological differences between natural and hatchery-raised salmon. NOAA-Fisheries, Nov. 2006, \$1,420,000
- Sealey, W. and M. Powell. Investigating how host-microbial interactions determine nutrient utilization in the trout intestine. NSF-MIP, Oct. 2006, \$326,372
- Sealey, W., and M. Powell. Depot-related gene expression in tissues from obese rainbow trout that naturally lack central production of alpha melanocyte stimulating hormone. NIH, R29 exploratory proposal, Sep. 2006, \$328,742
- Battisti, T.J. and M. Powell. Aquaculture software for determining fish growth rate, health and relative size. USDA-SBIR, Sep. 2006, \$99,612
- Powell, M.S., D. Stone and W. Sealey. Evaluating predictive adaptive response among naïve and artificially selected populations of rainbow trout. NSF-IOB, Jul. 2006, \$292,966
- Powell, M.S., R.W. Hardy, T. Flagg and P. Kline. Differences in functional genes between hatchery and wild Chinook salmon. Bonneville Power Administration, Jan. 2006, \$1,589,426
- Hristov, A., S. Hampton, M. Powell and R. Hardy. Determining relative effects of nutrient discharge from trout and dairy farms in the Snake River watershed using isotope techniques. WSU/UI Aquaculture Initiative (USDA-CSREES), Nov. 2005, \$35,000
- Hardy, R.W., W. Sealey, M.S. Powell and E.L. Brannon Native American fisheries education enhancement. NSF-DUE, Feb. 2005, \$999,753
- Talbot, A., L. Adler, E. Brannon, S. Hyun, M. Powell, S. Smith, and T. Quinn. Analytical approach for determination of hatchery reform on extinction risk and recovery of salmon and steelhead. Bonneville Power Administration, Apr. 2003, \$168,133
- Powell, M.S. Genetic Analysis of coastal cutthroat trout samples from the Umpqua River basin. USFWS, May 1999, \$10,000
- Brannon, E.L. and M.S. Powell. Phylogenetic patterns among maternal lineages of sympatric populations of sockeye salmon (*Oncorhynchus nerka*). NSF-DEB, Jul. 1996, \$229,870

#### **Presentations and Other Creative Activities:**

- Video presentation: The endangered Pacific Northwest sockeye salmon, 1999  
 Designed a Skyline display for Aquaculture Research Institute, 1999  
 Script for video presentation at the visitor kiosk, Hagerman National Fish Hatchery, 1998  
 Designed a 2-fold brochure for the Aquaculture Research Institute, 1996

#### **Honors and Awards:**

- Award of Merit, Idaho Chapter, American Fisheries Society

#### **SERVICE:**

**Major Committee Assignments:**

UI Faculty Affairs Committee 2017 - present  
 UI Animal Care and Use Committee 2013 – present  
 Western Regional Aquaculture Center (USDA) Research Technical Committee 2011 - present  
     Research Subcommittee for the Executive Committee 2013 – present  
     Chair Research Subcommittee for Board of Directors 2014- present  
 Federal Demonstration Partnership Committee (National Academies) for UI, 2014-2015  
 UI Information Technology Committee 2008 – 2014  
 UI Faculty Appeals Hearing Board Committee 2009 – 2012  
 US Aquaculture Society Awards Committee 2009 – 2011  
 US Aquaculture Society Finance Committee 2009 – 2011  
 UI Presidential Search Committee 2008  
 FWR Promotion and Tenure Committee 2017  
 AVS 3<sup>rd</sup> Year Review Committee 2017  
 AVS Development Committee, 2008 – present  
 AVS faculty search committee, muscle physiologist 2007  
 AVS faculty search committee, reproductive physiologist 2006  
 AVS Safety Committee, 2005 - 2008  
 American Fisheries Society, Ted Bjornn / IDAFS Scholarship Committee, 2005 - 2007  
 White Sturgeon Genetics Workgroup. (Bonneville Power Administration), 1998 - 2006  
 Technical Oversight Committee for Threatened Snake River Chinook Salmon. (Bonneville Power Administration), 1996 - 2008.  
 Technical Oversight Committee for Endangered Snake River Sockeye Salmon. (Bonneville Power Administration) 1995 - 2012.

**Professional and Scholarly Organizations:**

World Aquaculture Society  
 American Fisheries Society, Genetics Section, (President, Idaho Chapter 2004, V. Pres. 2002)  
 US Aquaculture Society  
 Idaho Aquaculture Association  
 Phi Sigma (non-active)  
 Sigma Xi (non-active)

**Manuscripts reviewed for the following publications:**

Associate Editor - *Transactions of the American Fisheries Society*. 2013-present  
 Editorial Board – Western Regional Aquaculture Center. 2012-present  
 Editorial Board – *Journal of Veterinary Science and Medical Diagnosis*. 2012-present  
 Editorial Board – *Fisheries and Aquaculture Journal*. 2013-present

*Animal Nutrition*  
*Aquaculture*  
*Aquaculture Research*  
*BMC Evolutionary Biology*  
*BMC Genomics*  
*Comp. Biochemistry and Physiology*  
*Conservation Genetics*  
*Endangered Species Act at Thirty*  
*Fisheries*  
*Gene*  
*International Aquatic Research*  
*Journal of Ag and Food Chemistry*  
*Journal of Animal Science*

*Journal of Applied Aquaculture*  
*Journal of Aquatic Animal Health*  
*Journal of Fish and Wildlife Management*  
*Journal of Fish Biology*  
*Journal of Fish Diseases*  
*Journal of the World Aquaculture Society*  
*Molecular Ecology Resources*  
*North American Journal of Fisheries Management*  
*North American Journal of Aquaculture*  
*PLoS One*  
*Transactions of the American Fisheries Society*  
*Veterinary Parasitology*  
*U.S. Congressional Research Service*

**Grant proposals and promotion packets reviewed for the following universities / agencies:***International*

Deutsche Forschungs Gemeinschaft (German Research Foundation), 2017  
 North Pacific Research Board, 2007 - present  
 U.S. Civilian Research and Development Foundation (CRDF) 2012, 2013, 2016, 2017  
 Rhodes University, South Africa, external reviewer for faculty promotion 2015  
 New Zealand Ministry of Business, Innovation & Employment, 2013  
 Universita Degli Studi Di Padova, Italy, external reviewer for projects, 2013  
 Quebec, Canada, Fonds Quebecois de la Recherché sur la Nature et les Technologies (FQRNT), 2010  
 Arctic-Yukon-Kuskokwim Sustainable Salmon Initiative, 2006

*National*

Sea Grant panel reviewer, 2017  
 United States Department of Agriculture, CSREES  
     Small Business Innovative Research, 2006  
     NRICGP Panel, 1999  
 SDE/Graduate Women in Science Fellowships 2008

*Regional*

Great Lakes Fish and Wildlife Research Directorate 2009 - present  
 California Sea Grant 2009  
 Whirling Disease Initiative, 2005, 2006  
 Exxon Valdez Oil Spill Trustee Council 2005, 2006, 2009  
 Bonneville Power Administration, Mid-Columbia Steelhead Review, 2006  
 United States Fish and Wildlife Service Green Bay Fisheries Resource Office, 2003  
 Maine Sea Grant, 2002

*University*

UI Seed Grant review 2011, 2015 - present  
 WSU/UI Aquaculture Initiative, 2004, 2005

**Student presentations judged for the following meetings:**

World Aquaculture Society /Aquaculture America Meetings, 2004 - present  
 University of Idaho, Innovation Showcase 2011 - 2014

**Professional meetings organized and chaired:**

Idaho Chapter, American Fisheries Society Annual Meeting, Moscow, ID, 2004  
 White Sturgeon Symposium, Western Division, American Fisheries Society Annual Meeting,  
 Moscow, ID, 1999

**Outreach Service:**

## Popular press featuring research:

"Ultrasound helps stage sturgeons for caviar production." *Global Aquaculture Advocate* (2010).  
 "Cultivating a passion for research", *Programs and People*, Summer 2007  
 "Fishing for DNA" (lead story), *Times News*, Twin Falls, ID, Feb. 2007  
 "Students team up with UI fish station", *Ag Weekly*, Twin Falls, ID, Feb. 2007  
 "Idaho's fish research makes international impact", *Idaho Magazine*, Winter 2007  
 "Fish students all the way from Taiwan", *Gooding County Leader* Aug. 2007  
 "Hatchery releases contribute to sockeye salmon recovery", *Programs and People*, Winter 2006  
 "Northwest researchers working to save lonely, homely fish", *Northwest Science and Technology*, Jan. 2006  
 "New tests diagnose diseases without killing salmon or trout", *Programs and People*,

#### Summer 2005

- “Laboratory profile” American Fisheries Society, *Genetics Section Newsletter*, May 2005
- “UI animal scientist uses genetic analysis to fish for answers”, *Buhl Herald*, June 2005
- “Sockeye rescue effort starts to produce results”, *Times News*, Twin Falls, ID, Sep. 2002
- “Why do Fish Fry?” Science Friday Interview on *National Public Radio*, April 2001
- “Wildlife biologists quick to adopt genetics”, *Christian Science Monitor*, Sep. 2000
- “Suzuki, Great American Outdoors”, *ESPN / ESPN 2*, 2000 – 2001
- “Fish Experiment Station goes high tech”, *Ag Weekly*, Dec. 1999

#### Popular publications and press related to research:

- Powell, M. Can species interbreed? *Esquire Magazine*, June 2004

#### Extension publications:

- Powell, M. S. 2007. Early disease detection in fish. University of Idaho Extension, *Impact*.
- Powell, M. 1998. Genetic impacts of aquaculture on biodiversity. *Idaho Aquaculture News*, Summer edition.
- Powell, M. 1998. Quantitative genetics in aquaculture. University of Idaho, *Extension Focus*, 12:6-8
- Powell, M. 1998. Genetic impacts of aquaculture on biodiversity. *Idaho Aquaculture News*, Summer edition.

#### Community Service:

- Sundance Film Festival (full time volunteer, 2008 - 2011)
- 2010 “Volunteer of the Year”
- Idaho Film Bureau, production assistant, location scout and screenwriter (2005 - 2012)
- HOIST (Helping Orient Indian Students and Teachers) mentor/instructor, Summer 1996
- Univ. of Idaho Upward Bound students-at-risk program instructor, Summer 1996

#### PROFESSIONAL DEVELOPMENT:

##### Teaching:

- Models and Techniques for Effective Online/Distance Course Development and Teaching, Moscow, ID, Oct. 2004

##### Scholarship:

- Microbiome Informatics Workshop and Research Forum, Oregon State University, Corvallis, 2017
- ARPAS exam for professional animal scientist certification (aquaculture), Moscow, ID, June 2007
- SAS Methods Workshop, University of Idaho, 2004
- Univ. of Idaho, Proposal development writing workshop, Moscow, ID, Dec. 2003.
- USFWS Hatchery Management workshop, Richland, WA, Oct. 2001
- NMFS, Allele Standardization workshop, Seattle, WA, Nov. 2000
- Western Regional Aquaculture Center, Sturgeon Broodstock Management workshop, Twin Falls, ID, Sep. 1996

##### Outreach:

- Media Relations Workshop, Idaho Chapter, American Fisheries Society, Boise, ID, Feb. 2005

##### Administration/Management:

- NSF-PFI workshop on Science and Innovation, Washington, DC, April 2010
- NSF-PFI workshop on Science and Innovation, Washington, DC, April 2009
- Applying Sound Research Administration Decisions, Pls, Deans and Directors, University of Idaho July 2006
- USDA/CSREES Funding Opportunities workshop for competitive grants programs, Dec. 2004