

Phaedra Budy - Curriculum Vitae

USGS - Utah Cooperative Fish and Wildlife Research Unit
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EDUCATION

Ph.D. - Aquatic Ecology. Utah State University, Logan, UT. December 1996.

B.S. - Limnology. University of California, Davis, CA. June 1991.

EMPLOYMENT

2013 - present. *Professor, Unit Leader.* Department of Watershed Sciences, Quinney College of Natural Resources. USGS Utah Cooperative Fish and Wildlife Research Unit, Utah State University, Logan, UT.

2010 - 2012. *Professor, Asst. Unit Leader.* Department of Watershed Sciences, Quinney College of Natural Resources. USGS Utah Cooperative Fish and Wildlife Research Unit, Utah State University, Logan, UT.

2006 - 2010. *Associate Professor, Assistant Coop Leader.* Department of Watershed Sciences, College of Natural Resources. USGS Utah Cooperative Fish and Wildlife Research Unit, Utah State University, Logan, UT.

2006 - present. *Assistant Director,* Intermountain Center for River Rehabilitation and Restoration, Department of Watershed Sciences, College of Natural Resources, Utah State University, Logan, UT.

2000 - 2006. *Assistant Professor, Assistant Coop Leader.* Department of Watershed Sciences, College of Natural Resources. USGS Utah Cooperative Fish and Wildlife Research Unit, Utah State University, Logan, UT.

1997 - 2000. *Quantitative Fishery Biologist, GS12-02, Conservation Assessment Team Leader.* US Fish and Wildlife Service. Columbia River Fisheries Program Office, Vancouver, WA.

1996 - 1997. *Postdoctoral fellow.* Utah State University, Colorado State University, Puerto Rico LTER site. Focus: *Atyad shrimp population dynamics and conservation genetics.*

1996 - 1997. *Assistant Program Chair.* The Ecology Center, Utah State University, Logan, UT. Ecological Society of America Conference.

1992 - 1996. *Research Assistant.* Department of Fisheries and Wildlife, Utah State University, Logan, UT. Ph.D. Dissertation: *Adding nutrients to enhance the growth and production of endangered sockeye salmon: trophic transfer in an oligotrophic lake.*

PEER-REVIEWED PUBLICATIONS

Lead Authorship Key:

- **** **Lead Author is/was an undergraduate I directly supervised**
- *** **Lead Author is/was a MS student I directly supervised**
- ** **Lead Author is/was a PhD student I directly supervised**
- * **Lead Author is/was a Post-doctoral fellow I directly supervised**

1. Beauchamp, D.A., P. **Budy**, B.C. Allen, and J.M. Godfrey. 1994. Timing, distribution, and abundance of kokanees spawning in a Lake Tahoe tributary. *Great Basin Naturalist* 54:130-141.
2. **Budy**, P., C. Luecke, W. Wurtsbaugh, and H. Gross. 1994. Effects of nutrient enhancement on juvenile sockeye salmon growth. *Lake and Reservoir Management* 9:140-145.
3. **Budy**, P., C. Luecke, W. Wurtsbaugh, and H. Gross. 1995. Limnology of Sawtooth Valley Lakes with respect to potential growth of juvenile Snake River sockeye salmon. *Northwest Science* 69:133-150.
4. Luecke, C., W. Wurtsbaugh, P. **Budy**, and G. Steinhart. 1995. Simulated growth and production of endangered Snake River sockeye salmon: assessing management strategies for nursery lakes. *Fisheries* 26:18-25.
5. Gross, H.P., W.A. Wurtsbaugh, C. Luecke, and P. **Budy**. 1997. Fertilization of an oligotrophic lake with a deep chlorophyll maximum: predicting the effect on primary productivity. *Canadian Journal of Fisheries and Aquatic Sciences* 54:1177-1189.
6. Wurtsbaugh, W.A., H.P. Gross, C. Luecke, and P. **Budy**. 1997. Nutrient limitation of oligo-trophic sockeye salmon lakes of Idaho (USA). *Verh. Internat. Verein. Limnol.* 26:413-419.
7. Beauchamp, D.A., P. **Budy**, and 6 others. 1997. Hydroacoustic assessment of abundance and diel distribution of sockeye and kokanee salmon in the Sawtooth Valley Lakes, Idaho. *North American Journal of Fisheries Management* 17:253-267.
8. **Budy**, P., C. Luecke, and W.A. Wurtsbaugh. 1998. Adding nutrients to enhance growth and production of endangered sockeye salmon: Trophic transfer in an oligotrophic lake. *Transactions of the American Fisheries Society* 127:19-34.
9. Petrosky, C.E., H.A. Schaller, and P. **Budy**. 2001. Productivity and of survival trends in the freshwater spawning and rearing life stage of Snake River spring/summer Chinook salmon (*Oncorhynchus tshawytscha*). *Canadian Journal of Fisheries and Aquatic Sciences* 58:1196-1207.
10. Wurtsbaugh, W.A., H.P. Gross, P. **Budy**, and C. Luecke. 2001. Effects of epilimnetic versus metalimnetic fertilization on the phytoplankton and periphyton of a mountain lake with a deep chlorophyll maxima. *Canadian Journal of Fisheries and Aquatic Sciences* 58:2156-2166.
11. **Budy**, P., G.P. Thiede, N. Bouwes, C. Petrosky, and H. Schaller. 2002. Evidence linking delayed mortality of Snake River Salmon to their earlier hydrosystem experience. *North American Journal of Fisheries Management* 22:35-51.

12. *** McHugh, P., and **P. Budy**. 2004. Patterns of spawning habitat selection and suitability for two populations of Snake River spring Chinook salmon, with an evaluation of generic versus site-specific suitability criteria. *Transactions of the American Fisheries Society* 133:89-97.
13. *** McHugh, P., **P. Budy**, and H. Schaller. 2004. A model-based assessment of the potential response of Snake River spring/summer chinook salmon to habitat improvements. *Transactions of the American Fisheries Society* 133:622-638.
14. *** de la Hoz Franco, E.A., and **P. Budy**. 2004. Linking environmental heterogeneity to the distribution and prevalence of *Myxobolus cerebralis*: a comparison across sites in a northern, Utah. *Transactions of the American Fisheries Society* 133:1176-1189.
15. *** de la Hoz Franco, E.A., and **P. Budy**. 2005. Effects of biotic and abiotic factors on the distribution of trout and salmon along a longitudinal stream gradient. *Environmental Biology of Fishes* 72:379-391.
16. **Budy**, P., T. Haddix, and R. Schneidervin. 2005. Zooplankton size selection relative to gill raker spacing in rainbow trout (*Oncorhynchus mykiss*). *Transactions of the American Fisheries Society* 134:1228-1235.
17. *** Haddix, T. and **P. Budy**. 2005. Factors that limit growth and abundance of rainbow trout (*Oncorhynchus mykiss*) across ecologically distinct areas of Flaming Gorge Reservoir, Utah-Wyoming. *North American Journal of Fisheries Management* 25:1082-1094.
18. *** McHugh, P., and **P. Budy**. 2005. A comparison of visual measurement-based techniques for quantifying cobble embeddedness and fine sediment levels in salmonid-bearing streams. *North American Journal of Fisheries Management* 25:1208-1214.
19. ** McHugh, P., and **P. Budy**. 2006. An experimental evaluation of competitive and thermal effects on brown trout (*Salmo trutta*) and cutthroat trout (*Oncorhynchus clarki utah*) performance along an altitudinal gradient. *Canadian Journal of Fisheries and Aquatic Sciences* 62:2784-2795.
20. ** Al-Chokhachy, R., **P. Budy**, and H. Schaller. 2005. A comparison of redd counts and mark/resight methods for estimating abundance and monitoring bull trout population trends. *North American Journal of Fisheries Management* 25:1505-1512.
21. ** McHugh, P., and **P. Budy**. 2006. Experimental effects of nonnative brown trout on the individual- and population-level performance of native cutthroat trout. *Transactions of the American Fisheries Society* 135:1441-1455.
22. **Budy**, P., G.P. Thiede, P. McHugh. 2007. A quantification of survival, site-fidelity, abundance, and trend for an important population of endemic cutthroat trout. *North American Journal of Fisheries Management* 27:593-604.
23. **Budy**, P., and H. Schaller. 2007. Evaluating tributary restoration potential for Pacific Salmon recovery. *Ecological Applications* 17:1068-4086.

24. *** Vatland, S., and **P. Budy**. 2007. Predicting the invasion success of an introduced omnivore in a large, heterogeneous reservoir. *Canadian Journal of Fisheries and Aquatic Sciences* 64:1329-1345.
25. ** Al-Chokhachy, R., and **P. Budy**. 2007. Summer microhabitat use of fluvial bull trout in Eastern Oregon streams. *North American Journal of Fisheries Management* 27:1068-1081.
26. ** McHugh, P., **P. Budy**, G.P. Thiede, and E. VanDyke. 2008. Trophic relationships of nonnative brown trout, *Salmo trutta*, and native Bonneville cutthroat trout, *Oncorhynchus clarkii utah*, in a northern Utah, U.S.A. river. *Environmental Biology of Fishes* 81:63-75.
27. *** Vatland, S., **P. Budy**, and G.P. Thiede. 2008. An approach to modeling striped bass and threadfin shad predator-prey dynamics in Lake Powell, Utah-Arizona. Special Section: Bioenergetics Modeling. *Transactions of the American Fisheries Society* 137:262-277.
28. *** Homel, K. and **P. Budy**. 2008. Temporal and spatial variability in the migration patterns of juvenile and subadult bull trout (*Salvelinus confluentus*) in Northeast Oregon. *Transactions of the American Fisheries Society* 137:869-880.
29. *** Homel, K., **P. Budy**, M.E. Pfrender, T.A. Whitesel, and K. Mock. 2008. Evaluating genetic structure among resident and migratory forms of bull trout (*Salvelinus confluentus*) in Northeast Oregon. *Ecology of Freshwater Fish, Online Early Articles*: doi:1-.1111/j.160-0633.2008.00299.x.
30. **Budy, P.**, G.P. Thiede, P. McHugh, E.S. Hansen, and J. Wood. 2008. Exploring the relative influence of biotic interactions and environmental conditions on the abundance and distribution of exotic brown trout (*Salmo trutta*) in a high mountain stream. *Ecology of Freshwater Fish* 17:554-566.
31. ** Al-Chokhachy, R., and **P. Budy**. 2008. Demographic characteristics, population structure, and vital rates of a fluvial population of bull trout in Oregon. *Transactions of the American Fisheries Society* 137:262-277.
32. ** Al-Chokhachy, R., **P. Budy**, and M. Conner. 2009. Detecting declines in the abundance of a bull trout (*Salvelinus confluentus*) population: understanding the accuracy, precision, and costs of our efforts. *Canadian Journal of Fisheries and Aquatic Sciences* 66: 649-658.
33. *** Wood, J., and **P. Budy**. 2009. An investigation of the early life-history and potential influences on invasion success of exotic of brown trout (*Salmo trutta*). *Transactions of the American Fisheries Society* 138:756-767.
34. **Budy, P.**, G.P. Thiede, C. Luecke, and R.W. Schneidervin. 2009. Warmwater and coldwater fish in two-story standing waters. *Invited*. Pages 159 – 169 in S. Bonar, W.A Hubert, and D.W. Willis, editors. *Standard methods for sampling North American freshwater fishes*. American Fisheries Society, Bethesda, Maryland.
35. * Miller, S.W., **P. Budy**, and J.C. Schmidt. 2010. Quantifying macroinvertebrate responses to in-stream habitat restoration: applications of meta-analysis to river restoration. *Restoration Ecology* 18:8-19.

36. Al-Chokhachy, R., B.B. Roper, T. Bowerman, and **P. Budy**. 2010. A review of bull trout habitat associations and exploratory analyses of patterns across the Interior Columbia River Basin. *North American Journal of Fisheries Management* 30:464-480.
37. Vinson, M., and **P. Budy**. 2011. Sources of variability and comparability between salmonids stomach contents and isotopic analyses: study design lessons and recommendations. *Canadian Journal of Fisheries and Aquatic Sciences* 68:137-151.
38. *** Hansen, E., and **P. Budy**. 2011. The potential of passive stream restoration to improve ecosystem health and minimize the impact of fish disease: a short-term assessment. *Journal of the North American Benthological Society* 30:573-588.
39. **Budy, P.**, M.E. Baker, and S.K. Dahle. 2011. Predicting fish growth potential and identifying potential water quality issues: a spatially explicit bioenergetics approach. *Environmental Management*. 48:691-709.
40. Lobón-Cerviá, J., G. González, and **P. Budy**. 2011. Factors driving spatial and temporal variation in production and production / biomass ratio of stream-resident brown trout (*Salmo trutta*) in Cantabrian streams. *Freshwater Biology* 56:2272-2287.
41. McIntosh, A. R., P. A. McHugh, and **P. Budy**. 2011. Brown trout (*Salmo trutta*). Invited. Pages 285-296 in R. A. Francis, editor, *A Handbook of Global Freshwater Invasive Species*. Earthscan, London, UK. (<http://www.earthscan.co.uk/>).
42. McHugh, P., A. McIntosh, S. Howard, and **P. Budy**. 2012. Niche flexibility and trout-galaxiid co-occurrence in a hydrologically-diverse riverine landscape. *Biological Invasions* doi:10.1007/s10530-012-0237-6.
43. Lobón-Cerviá, J., **P. Budy**, and E. Mortensen. 2012. Patterns of natural mortality in stream-living Brown Trout (*Salmo trutta L.*). *Freshwater Biology* 57:575-588.
44. **Budy, P.**, S. Wood[Seidel], and B. Roper. 2012. A study of the spawning ecology and early life history of Bonneville cutthroat trout. *North American Journal of Fisheries Management* 32:436-449.
45. *Salant, N.L., J. C. Schmidt, **P. Budy**, P. R. Wilcock. 2012. Unintended consequences of restoration: Loss of riffles and gravel substrates following weir installation. *Journal of Environmental Management* 109:154-163.
46. ***Webber, P. A., P. Thompson, and **P. Budy**. 2012. Status and structure of two populations of bluehead in the Weber River, UT. *Southwest Naturalist* 57:267-276.
47. **Bowerman, T. and **P. Budy**. 2012. Incorporating movement patterns to improve survival estimates for juvenile bull trout *North American Journal of Fisheries Management* 32:1123-1136.
48. **Budy, P.**, G.P. Thiede, A. Dean. D. Olsen, and G. Rowley. 2012. A comparative and experimental evaluation of the performance of diploid and triploid brook trout. *North American Journal of Fisheries Management* 21:1211-1224.

49. *** Bottcher, J.L., T.E. Walsworth, G.P. Thiede, **P. Budy**, and D. Speas. 2013. Frequent usage of tributaries by the endangered fishes of the upper colorado river basin: observations from the San Rafael River, Utah. *North American Journal of Fisheries Management, Management Brief* 33:585-594.
50. **Budy, P.**, G.P. Thiede, J. Lobon-Cervia, G. Gonzales, P. A McHugh, A. McIntosh, L.A. Vollestad, E. Becares and P. Jellyman. 2013. Limitation and facilitation of one of the world's most invasive fish: an intercontinental comparison. *Ecology* 94:356-367.
51. ***Walsworth, T.E., **P. Budy**, and G.P. Thiede. 2013. Longer food chains and crowded niche space: effects of multiple invaders on imperiled desert fishes. *Ecology of Freshwater Fish* 22: 439-452.
52. Hough-Snee, N. Roper, B.R., Wheaton, J.M., and **P. Budy**. 2013. Riparian vegetation communities change rapidly following passive restoration at a northern Utah stream. *Ecological Engineering* 58:371-377.
53. **Meredith, C., **P. Budy**, and G.P. Thiede. 2014. Predation on native sculpin by exotic brown trout exceeds that by native cutthroat trout within a mountain watershed (Logan, UT, USA). *Ecology of Freshwater Fish* 24:133-147. doi: 10.1111/eff.12134. USGS FSP: IP-042175.
54. **Bowerman, T., Neilson, B. and **P. Budy**. 2014. Effects of fine sediment, hyporheic flow, and spawning site selection on survival and development of bull trout embryos. *Canadian Journal of Fisheries and Aquatic Sciences* 71:1-13. doi.org/10.1139. USGS FSP: IP-049185.
55. *Saunders, W.C., **P. Budy**, and G. Thiede. 2014. Demographic Changes Following Mechanical Removal of Exotic Brown Trout in an Intermountain West (USA), High-Elevation Stream. *Ecology of Freshwater Fish*. doi: 10.1111/eff.12143. USGS FSP: IP-034361.
56. **Budy, P.** and C. Luecke. 2014. Understanding how lake populations of Arctic char are structured and function with special consideration of the potential effects of climate change: a multi-faceted approach. *Oecologia* 176:81-94. USGS FSP: IP-053259.
57. Bennet, S., B. Roper, R. Al-Chokhachy, and **P. Budy**. 2014. Annual variation of spawning cutthroat trout in a small western USA stream: a case study with implications for the conservation of potamodromous trout life history diversity. *North American Journal of Fisheries Management* 34:1033-1046. USGS FSP:IP-050825.
58. *Laub, B.G., and **P. Budy**. 2015. Assessing the likely effectiveness of multi-species management for imperiled desert fishes using niche overlap analysis. *Conservation Biology* 29:1153-1163. DOI: 10.1111/cobi.12457. USGS FSP: IP-058151.
59. ****Hafen, K. and **P. Budy**. 2015 Agonistic behavior among three stocked trout species. *North American Journal of Fisheries Management, Management Brief*: 35:551-556. USGS FSP: IP-058150.
60. **Budy, P.**, M. M. Conner, N.L. Salant, and W. Macfarlane. 2015. An occupancy-based assessment of regional vulnerability for desert fishes of the SW USA. *Conservation Biology* 29:1142-1152. DOI: 10.1111/cobi.12513. USGS FSP: IP-049189.

61. ***Walsworth, T.E., and P. **Budy**. 2015. Integrating non-native species in niche models to prioritize native fish restoration activity locations along a desert river corridor. *Transactions of the American Fisheries Society* 144:667–681. *USGS FSP: IP-034122*.
62. Dibble, K.L., C.B. Yackulic, T.A. Kennedy, P. **Budy**. 2015. Flow management and fish density regulate salmonid recruitment and adult size in tailwaters across western North America. *Ecological Applications*. 25:2168-2179. *USGS FSP: IP-066089*.
63. *Laub, B. G., J. Jimenez, and P. **Budy**. 2015. Adopting science-based restoration in practice: application to a desert river system. *Environmental Management ONLINE FIRST*: DOI 10.1007/s00267-015-0481-5. *USGS FSP: IP-053441*.
64. ***Winters, L. and P. **Budy**. 2015. Exploring crowded trophic niche space in a novel reservoir fish assemblage: how many predators is too many? *Transactions of the American Fisheries Society* 144:1117-1128. *USGS FSP: IP-065178*.
65. ***Klobucar, S. and P. **Budy**. 2016. Consequences of seasonal variation in reservoir water level for predatory fishes: linking visual foraging and prey densities. *Canadian Journal of Fisheries and Aquatic Sciences* 73: 53-6464. *USGS FSP: IP-058204*.
66. **Klobucar, S.L., W.C. Saunders, and P. **Budy**. 2016. *A Lota lota* consumption: trophic dynamics and niche space influence of invasive Burbot in a valuable sport fishery. *Transactions of the American Fisheries Society*. Early On-Line. DOI: 10.1080/00028487.2016.1227372. *USGS FSP: IP-074691*.
67. **Meredith, C.S., P. Budy, and M. Hooten. 2016. Assessing abiotic conditions influencing the longitudinal distribution of exotic brown trout in a mountain stream: a spatially-explicit modeling approach. *Biological Invasions* 19:503-519. DOI 10.1007/s10530-016-1322-z. *USGS IP-069503*.
68. ***Winters, L.K., P. **Budy**, and G.P. Thiede. 2017. Earning their stripes: the potential of tiger trout and other salmonids as biological controls of forage fishes in a western reservoir. *North American Journal of Fisheries Management* 37:380-394. *USGS IP-074773*. DOI:10.1080/02755947.2016.1264509.
69. ***Strohm, D. P. **Budy**, and T.A. Crowl. 2017. Matching watershed and otolith chemistry to establish natal origin of an endangered desert lake sucker. *Transactions of the American Fisheries Society* 146:732-743. DOI: 10.1080/00028487.2017.1301994. *USGS IP-069787*.
70. **Klobucar, S.L., T.W. Rodgers, and P. **Budy**. 2017. At the forefront: evidence of the applicability of using environmental DNA to quantify the abundance of fish populations in natural lentic waters with additional sampling considerations. *Canadian Journal of Fisheries and Aquatic Sciences*. 00: 1–5 (0000) DX.DOI.ORG/10.1139/CJFAS-2017-0114. *USGS IP-086031*.
71. **Budy**, P., T. Bowerman, R. Al-Chokhachy, M.M. Conner, and H. Schaller. 2017. Quantifying long-term population trends of threatened bull trout: challenges, lessons learned, and opportunities. *Canadian Journal of Fisheries and Aquatic Sciences: Rapid Communication* 74(12): 2030-2034, <https://doi.org/10.1139/cjfas-2017-0114> *USGS IP-066765*.

72. **Budy**, P. and J. Gaeta. *In press*. Brown trout as an invader: A Synthesis of Problems and Perspectives in Western North America. *Invited Chapter 12.1 in: The Brown Trout *Salmo trutta* L.: A primer on a paradigmatic species*. Editors: Javier Lobón-Cerviá & Nuria Sanz Ball. Ilosera. Wiley. *USGS FSP: IP-074692*.
73. Laub, B.G., G.P. Thiede, W.W. MacFarlane, and P. **Budy**. 2017. Evaluating the conservation potential of tributaries for native fish in the Upper Colorado River Basin. *Fisheries Accepted 26 September, 2017. USGS IP: 081178*.
74. **Budy**, P., K.B. Rogers, Y. Kanno, B. Penaluna, N.H. Hitt, J. Dunham, C. Mellison, and W.L. Somer., and J. DeRitto. *In press*. Distribution and Status of Trouts and Chars in North America. *Invited Chapter 8 in: Diversity and Status of Trouts and Chars of the World*. Editors: J.L. Kershner, J. E. Williams, R. E. Gresswell. Transactions of the American Fisheries Society. Symposium Book. *USGS FSP: IP-088494*.
75. Hansen, M., P. **Budy**, C. Guy, and T. McMahon. *In press*. Trout as Native and Invasive Species: a Management Paradox. *Invited Chapter 819 in: Diversity and Status of Trouts and Chars of the World*. Editors: J.L. Kershner, J. E. Williams, R. E. Gresswell. Transactions of the American Fisheries Society. *USGS FSP: IP-XX*.
76. Dornelas, M and P. **Budy** (#25) and 182 others. BioTIME: a database of biodiversity time series for the Anthropocene. Submitted 8 February, 2017 to Global Ecology and Biogeography. *USGS FSP: being handled by USGS co-author*.

PUBLICATIONS IN REVIEW /REVISION

LaPlanche, C. A. Elger, F. Santoul, and P. **Budy**. *In re-review*. Forecasting the eradication success of an exotic fish from an alpine stream. *Biological Conservation. Accepted pending major revisions 15 September, 2017. BIOC_2017_626. USGS FSP: IP-XX*.

**Klobucar, S.L., J.W. Gaeta, and P. Budy. *In re-review*. A changing menu in a changing climate: using experimental and long-term data to predict invertebrate prey biomass and availability in arctic lakes. *Freshwater Biology. Accepted pending minor revisions 24 November, 2017. Manuscript ID FWB-P-Jun-17-0265.R1. USGS FSP: IP-087907*.

Meredith, C. P. Budy, and J Schmidt. *In review*. Investigating scour depths in relation to patterns of spawning brown trout and the changing physical template of a mountain river. *Submitted to River Research and Applications. 28 December, 2017. USGS FSP: IP-XX*.

*** Heredia, N. and P. **Budy**. *In re-review*. Trophic ecology of Lahontan Cutthroat Trout *Oncorhynchus Clarkii Henshawi*: historical predator-prey interaction supports native apex predator in unique desert lake. *Submitted 26 September 2017 to Transactions of the American Fisheries Society. Accepted pending major revisions 4 November, 2017. Manuscript ID Society. TAFS-2017-0123. USGS FSP: IP-066465*.

PUBLICATIONS IN REVISION

*Saunders, W.C. ., and P. **Budy**. *In revision*. Can high densities of native Bonneville cutthroat trout minimize negative impacts of exotic brown trout establishment through biotic resistance? Transactions of the American Fisheries Society. *USGS FSP: IP-049187*.

SELECTED RECENT TECHNICAL REPORTS in last five years

Budy, P., A. Dean, G.P. Thiede, D. Olsen, and G. Rowley. 2010. Triploid trout in high Uinta lakes: a comparative evaluation of relative performance of triploid versus diploid brook trout. 2009 Annual Report to Utah Division of Wildlife Resources. Sport Fish Restoration, Grant number XIII. Project F-47-R. UCFWRU 2010(4):1-65.

Budy, P., B. Nadolski, and G.P. Thiede. 2010. Mill Creek trout study: factors affecting trout population dynamics, abundance, and distribution in the Mill Creek Basin, Utah. Project Completion Report to Utah Division of Wildlife Resources. Sport Fish Restoration. Grant Number XIII. Project F-47-R. UCFWRU 2010(5):1-34.

Budy, P., G.P. Thiede, W.C. Saunders, and C. Meredith. 2011. Logan River whirling disease study: factors affecting trout population dynamics, abundance, and distribution in the Logan River, Utah. 2010 Annual Report to Utah Division of Wildlife Resources. Sport Fish Restoration, Grant number XIII. Project F-47-R. UCFWRU 2011(2):1-36.

Budy, P., L.B. Tennant, T. Bowerman, and G.P. Thiede. 2011. Bull trout population assessment in northeastern Oregon: a template for recovery planning. 2010. Annual Progress Report to US Fish and Wildlife Service. UCFWRU 2011:1-88.

Budy, P. and N.L. Salant. 2011. Native fish status and trends and opportunities for improvement on the Lower Dolores River: Phase I. Report submitted to the Dolores River Dialogue Steering Committee. ICRRR 2011(1): 1-48.

Bestgen, K.R., Budy, P. and W.J. Miller. 2011. Status and trends of flannelmouth sucker *Catostomus latipinnis*, bluehead sucker *Catostomus discobolus*, and roundtail chub *Gila robusta*, in the Dolores River, Colorado, and opportunities for population improvement: Phase II Report. Final report submitted to the Lower Dolores Plan Working Group-Legislative Committee. Larval Fish Laboratory Contribution 166 and Intermountain Center for River Rehabilitation and Restoration 2011(2): 1-55, + appendices.

Gresswell, R.E., P. Budy, C. S. Guy, M. J. Hansen, M. L. Jones, P. J. Martinez, C. Suski, J. E. Williams. 2012. Confronting a lake trout invasion of Yellowstone Lake: An interim scientific assessment, June 14–16, 2011. A Report to the Superintendent of Yellowstone National Park. U.S. Geological Survey, Northern Rocky Mountain Science Center, Bozeman, Montana. YCR-2012-04.

Saunders, W.C., P. Budy, and G.P. Thiede. 2011. Evaluation of demographic change following two years of mechanical removal of exotic brown trout *Salmo trutta* in the Logan River, Utah. 2010 Annual Report to Utah Division of Wildlife Resources. Endangered Species Mitigation Fund, Project # 1111. UCFWRU 2011(4):1-28.

Budy, P., D. Epstein, T. Bowerman, and G.P. Thiede. 2012. Bull trout population assessment in northeastern Oregon: a template for recovery planning. 2011 Progress Report to US Fish and Wildlife Service. UCFWRU 2012(2):1-80.

- Budy, P., L. Winters, and G.P. Thiede. 2012. An investigation of the potential roles of interspecific interactions and forage availability on the performance of three predatory fishes. Draft 2011 Progress Report to the Utah Division of Wildlife Resources. UTCFWRU 2012(3):1-42.
- Budy, P., S. McKay, and G.P. Thiede. 2012. Weber River metapopulation and source-sink dynamics of native and endemic fishes. 2011 Progress Report to Utah Division of Wildlife Resources. Sport Fisheries Research, Grant Number: F-135-R, Section 1. UTCFWRU 2012(4):1-20.
- Budy, P., M. M. Conner, N.L. Salant, and W. Macfarlane. 2013. Occupancy-Based Assessment of Regional Vulnerability of Endemic Desert Fishes: A Template for Conservation Actions. Conservation Biology. UCFWRU 2013:1-37.
- Saunders, C., G. Thiede, S. Klobucar, and P. Budy. 2013. Hydroacoustic assessment of fish density and abundance in Strawberry Reservoir, Utah. 2013 Annual Report to Utah Division of Wildlife Resources. Watershed Restoration Initiative: Project ID 2328. UTCFWRU 2013(5):1-17.
- Laub, B.G., D. Dean, J. Jarnecke, J. Jimenez, P. Budy, D. Keller, W. Macfarlane, C. McGinty, P. Birdsey, D. Eddington, I. Gowing, C. Mellon, J. Schmidt, M. Scott, D. Speas, and K. Wilson. 2013. Restoration and monitoring plan for native fish and riparian vegetation on the San Rafael River, Utah. UTCFWRU 2013(8): 1-133.
- Budy, P., G.P. Thiede, W.C. Saunders, C. Meredith, H. Mohn, J. Augspurger, and B. Roholt. 2014. Logan River trout viability: long-term monitoring and evaluation. 2013 Progress Report to Utah Division of Wildlife Resources, Utah Watershed Restoration Initiative, and US Forest Service. UTCFWRU 2014(1):1-133.
- Budy, P., L. Winters, G.P. Thiede, K. Hafen, and B. Roholt. 2014. Scofield Reservoir predator-prey interactions: investigating the roles of interspecific interactions and forage availability on the performance of three predatory fishes. 2013 Project Completion Report to the Utah Division of Wildlife Resources. UTCFWRU 2014(2):1-123. USGS FSP IP-065178 & USGS IP-074773.
- Saunders, C., S. Klobucar, and P. Budy. 2014. Food web effects, seasonal movements, and spawning ecology of Burbot, a large invasive piscivore, in Flaming Gorge Reservoir, Utah and Wyoming. 2014 Completion Report to Utah Division of Wildlife Resources. Sportfish Research: Project ID 121041. UTCFWRU 2014(3):1-57.
- Budy, P., G.P. Thiede, M.D. McKell, and P. Thompson. 2014. Weber River metapopulation and source-sink dynamics of native and nongame fishes. 2013 Performance Report to Utah Division of Wildlife Resources. Sport Fish Restoration, Grant number: F-135-R, Segment 2. UTCFWRU 2014(4):1-54.
- Budy, P., N. Heredia, G.P. Thiede, and B. Laub. 2014. Pyramid Lake fishery evaluation: evaluating cutthroat trout performance and identifying limiting factors for the native fish community. Progress Report to US Fish and Wildlife Service, Lahontan National Fish Hatchery Complex, Great Basin Cooperative Agreement. UTCFWRU 2014(6):1-89. USGS FSP IP-066465.
- Strand, H., B. Laub, C. Hawkins, and P. Budy. 2015. Program review of Utah's state conservation agreements and strategies for aquatic species. Final Report prepared for the Recovery Programs Office, Utah Department of Natural Resources. Utah State University, Logan, Utah. 38 pp.

- Laub, B.G. and P. Budy. 2016. Ecological changes in aquatic communities in the Big Bend reach of the Rio Grande: Synthesis and future monitoring recommendations. Final Report to A. Roberson, Desert Landscape Conservation Cooperative. 48 pp.
- Budy, P., K. Chapman, and G.P. Thiede. 2016. Pelican predation effects on the fish community in Strawberry Reservoir. Annual Performance Report to Utah Division of Wildlife Resources. UTCFWRU 2016(1):1-29.
- Budy, P., P. Belmont, C. Finch, K. Schaffrath, and G.P. Thiede. 2016. Understanding the effects of wildfire on fish populations and stream geomorphology in Twitchell Canyon. Annual Performance Report to Utah Division of Wildlife Resources. UTCFWRU 2016(2):1-41.
- Budy, P., G.P. Thiede, D. Strohm, and P.D. MacKinnon. 2017. Tributary habitat use of endangered and imperiled fishes in the Price River, Utah. 2016 Final Progress Report to US Bureau of Reclamation, Grant number R11AC40021. UTCFWRU 2017(3):1-31.
- Budy, P., G.P. Thiede, N. Heredia, J. Gaeta, B. Maloney, and B. Laub. 2017. Draft Pyramid Lake management plan and associated supportive analyses. Draft Management Plan and Report of Progress to USFWS Lahontan National Fish Hatchery, Reno, Nevada. UTCFWRU 2017(1):1-74.
- Budy, P., G.P. Thiede, and K. Chapman. 2017. Pelican predation effects on the fish community in Strawberry Reservoir, Utah. Final Progress Report to Utah Division of Wildlife Resources. Sport Fish Restoration, Grant number: F-134-R, Segment 2. UTCFWRU 2017(2):1-59.
- Budy, P., B.C. Maloney, G.P. Thiede, T. Hafen, and H. Lucas. 2017. Weber River bluehead sucker recruitment bottleneck study: evaluating habitat-based niche requirements and potential recruitment bottlenecks for imperiled bluehead sucker (*Catostomus discobolus*). Final Progress Report to Utah Division of Wildlife Resources. Grant number 151126. UTCFWRU 2017(3):1-68.

PRESENTATIONS *in last five years only*

- Budy, P., M. Conner, N. Salant, and W. MacFarlane. 2012. Update on the occupancy based assessment of regional population status and vulnerability for three species of fish (bluehead sucker, flannelmouth sucker, and roundtail chub) in Utah: A template for assessing extinction risk and prioritizing conservation actions. Utah Chapter, American Fisheries Society, Annual Meeting, March 26-29, Bullfrog, UT.
- Meredith, C., P. Budy, and M. Hooten. 2012. Effects of a changing physical template on the distribution of brown trout in a mountain stream. Utah Chapter, American Fisheries Society, Annual Meeting, March 26-29, 2012, Bullfrog, UT.
- Thiede, G.P., P. Budy, C. Meredith, and W.C. Saunders. 2012. Exotic brown trout impacts: the case of a novel predator. Utah Chapter, American Fisheries Society, Annual Meeting, March 26-29, 2012, Bullfrog, UT.
- Hafen, K., W.C. Saunders, and P. Budy. 2012. Effects of impoundments on brown trout source-sink dynamics in the Logan River, Utah: Conservation implications for endemic Bonneville cutthroat

trout. Poster Presentation. Utah Chapter, American Fisheries Society, Annual Meeting, March 26-29, 2012, Bullfrog, UT.

Winters, L. P. Budy, and G.P. Thiede. 2012. Investigating food web interactions and exploring the potential for biological control of three top predatory fishes in a high elevation, western reservoir. Poster Presentation. Utah Chapter, American Fisheries Society, Annual Meeting, March 26-29, 2012, Bullfrog, UT.

Klobucar, S., P. Budy, and G.P. Thiede. 2012. Can we improve predator performance in trophically limited reservoirs: Results from a large-scale experiment. Utah Chapter, American Fisheries Society, Annual Meeting, March 26-29, 2012, Bullfrog, UT.

McKay, S., P. Budy, and G.P. Thiede. 2012. Weber River metapopulation and source-sink dynamics of native and endemic fishes. Utah Chapter, American Fisheries Society, Annual Meeting, March 26-29, 2012, Bullfrog, UT.

W.C. Saunders, and P. Budy. 2012. Biotic resistance by native Bonneville cutthroat trout to the establishment of exotic brown trout is influenced by population density. Utah Chapter, American Fisheries Society, Annual Meeting, March 26-29, 2012, Bull Frog, UT.

Heredia, N., P. Budy, and G.P. Thiede. 2012. Food web interactions in Pyramid Lake, Nevada: identifying factors limiting the performance of Lahontan cutthroat trout. Western Division, American Fisheries Society, Annual Meeting, March 26-29, 2012, Jackson, WY.

Jackson-Smith, D., A. Armstrong, N. Mesner, Lorien Belton, N. Salant, P. Budy, and D. Stevens . 2012. A comparison of alternative approaches to measuring BMP implementation, maintenance, and effectiveness. National Water Conference, May 20-24, 2012, Portland, OR.

Budy, P., G.P. Thiede, D. Beauchamp, and C. Luecke. 2012. Conflicts between native fish conservation and non-native lake trout sport fisheries: historical perspectives of two large, natural oligotrophic lakes, Lake Tahoe and Bear Lake. Invited Symposium Presentation. American Fisheries Society, National Meeting, August 19-23, 2012, Minneapolis, MN.

Budy, P., C. Luecke, and G.P. Thiede. 2012. Resources allocation among arctic char in closed arctic lakes: implications for population structure and regulation. Poster Presentation. American Fisheries Society, National Meeting, August 19-23, 2012, Minneapolis, MN.

Klobucar, S., P. Budy, and G.P. Thiede. 2012. Examining the potential of forage enhancement in trophically limited reservoirs: results from a large-scale experiment. American Fisheries Society, National Meetings, August 19-23, 2012, Minneapolis, MN.

Heredia, N. A., P. Budy, and G. P. Thiede. 2012. Food web interactions in Pyramid Lake, Nevada: factors influencing Lahontan cutthroat trout growth and production. American Fisheries Society, National Meeting, August 19-23, Minneapolis, MN.

Winters, L., P. Budy, and G.P. Thiede. 2012. Quantifying the potential for biological control of an explosive prey base by predatory fishes in a novel food web of a high elevation, western reservoir. American Fisheries Society, National Meeting, August 19-23, 2012, Minneapolis, MN.

- Gresswell, R.E., P. Budy, C.S. Guy, M.J. Hansen, M. Jones, P.J. Martinez, C. Suski, and J.E. Williams. 2012. Role of external peer review in supporting invasive species suppression efforts. Invited Presentation. American Fisheries Society, National Meeting, August 19-23, 2012, Minneapolis, MN.
- Budy, P., C. Luecke, and Gary P. Thiede. 2012. Resources allocation among arctic char in closed arctic lakes: implications for population structure and regulation. Poster. American Fisheries Society, National Meeting, August 19-23, 2012, Minneapolis, MN.
- Budy, P., G.P. Thiede, D.A. Beauchamp, and Chris Luecke. 2012. Conflicts between native fish conservation and non-native lake trout sport fisheries: Historical Perspectives of Two Large, Natural Oligotrophic Lakes, Lake Tahoe and Bear Lake. Invited Presentation. American Fisheries Society, National Meeting, August 19-23, 2012, Minneapolis, MN.
- Mesner, N., D. Jackson-Smith, D. Stevens, P. Budy. 2013. Assessment of Utah's Nonpoint Source (319) Program. 2013 Salt Lake Countywide Watershed Symposium, Salt Lake City, October 15, 2013.
- Budy, P., M.M. Conner, N.L. Salant, and W.W., Macfarlane. 2014. The Clock is Ticking for Desert Fishes of the SW USA: An Occupancy-based Assessment of Regional Vulnerability. American Fisheries Society, Western Division, 7-11 April, 2014, Mazatlán, Mexico.
- Budy, P., A. Giblin, G. Kling, and B. Crump. 2013. Arctic Lakes: what have we learned about system response to direct and indirect effects of climate change? Arctic LTER Mid-Term Review, Toolik Field Station, AK. 18 June 2013.
- Fisher, K. and P. Budy. 2013. Comparing Trophic Level Position of Invertebrates in Fish and Fishless Lakes in Arctic Alaska. Poster Presentation. Student Colloquium; Research on Capitol Hill, Salt Lake City, February, 2013.
- Klobucar, S.L., W.C. Saunders, C. Luecke, and P. Budy. 2013. A Lota lota consumption: trophic effects and potential impacts of a novel and voracious predator in Flaming Gorge Reservoir, WY-UT. American Fisheries Society, Utah Chapter, 26-29 March, 2013, Page, Arizona.
- Klobucar, S.L., W.C. Saunders, C. Luecke, and P. Budy. 2013. A Lota lota consumption: trophic effects and potential impacts of a novel and voracious predator in Flaming Gorge Reservoir, WY-UT. American Fisheries Society, Western Division, 15-18 April, 2013, Boise, Idaho.
- Klobucar, S.L., W.C. Saunders, C. Luecke, and P. Budy. 2013. Understanding the invasion success of a novel predator: burbot life history and trophic interactions in Flaming Gorge Reservoir, WY-UT. American Fisheries Society, 8-12 September, 2013, Little Rock, Arkansas.
- Laub, B. G., P. Budy, and J. Jimenez. 2013. Restoration of the San Rafael River and riparian corridor in southern Utah. Society of Wetland Scientists, 2-6 June, 2014, Duluth, Minnesota, USA.
- Laub, B. G., P. Budy, and J. Jimenez. 2013. Synthesizing population dynamics of native fish species and geomorphic analyses of channel change to guide restoration planning on the San Rafael River, Utah. American Fisheries Society, Utah Chapter, 26-29 March, 2013, Lake Powell Resort/Wahweap Marina, Page, Arizona, USA.

- Laub, B. G., P. Budy, and J. Jimenez. 2013. Restoration of the San Rafael River, Utah: An opportunity for assessment of cumulative project impacts on a large scale. River Crossings: Linking River Communities, River Management Society conference and workshop, 11-15 March, 2013, Grand Junction, Colorado, USA.
- Winters, L., P. Budy, and G.P. Thiede. 2013. Exploring the potential for biological control of an explosive prey base by a suite of three predatory fishes in a high elevation, western reservoir. Oral Presentation. American Fisheries Society, 143rd Annual Meeting, 8-12 September, 2013, Little Rock, Arkansas.
- Winters, L., P. Budy, and G.P. Thiede. 2013. Exploring the potential for biological control of an explosive prey base by a suite of three predatory fishes in a high elevation, western reservoir. Oral Presentation. American Fisheries Society, Western Division, 15-18 April, 2013, Boise, Idaho.
- Hafen, K., L. Winters, and P. Budy. 2013. Agnostic behavior between three species of salmonids commonly stocked in Utah reservoirs. Oral Presentation. American Fisheries Society, Western Division, 15-18 April, 2013, Boise, Idaho.
- Winters, L., P. Budy, and G.P. Thiede. 2013. Exploring the potential for biological control of an explosive prey base by a suite of three predatory fishes in a high elevation, western reservoir. Oral Presentation. Spring Runoff Conference, Utah State University, 9-10 April, 2013, Logan, Utah.
- Winters, L., P. Budy, and G.P. Thiede. 2013. Scofield Reservoir: exploring the potential for biological control of an explosive prey base by three top predatory fishes. Oral Presentation. American Fisheries Society, Utah Chapter, 26-28 March, 2013, Wahweap, Utah. *Best Student Presentation Award*.
- Hafen, K., L. Winters, and P. Budy. 2013. Agnostic behavior between three species of salmonids commonly stocked in Utah reservoirs. Oral Presentation. American Fisheries Society, Utah Chapter, 26-28 March, Wahweap, Utah.
- Budy, P. 2014. Arctic Lakes: Spring 2014 update and new direction. Arctic Long Term Ecological Research, 25-28. February, 2014, Woods Hole, Massachusetts.
- Klobucar, S.L. and P. Budy. 2014. In hot(ter) water: predicting zooplankton biomass and arctic char growth and consumption under climate change scenarios on the Alaska North Slope. Poster. Arctic Long Term Ecological Research, 25-28. February, 2014, Woods Hole, Massachusetts.
- Laub, B. G., J. Jimenez, and P. Budy. 2014. Restoration and monitoring plan for native fish and riparian vegetation on the San Rafael River, Utah. Tamarisk Coalition Research and Management Conference, 18-20 February, 2014, Grand Junction, Colorado, USA.
- Budy, P. 2014. Challenges to desert fish conservation and river restoration in the arid West: How can we avert the perfect storm? University of Missouri, Dept. of Fisheries and Wildlife Sciences. Invited Lecture: 5 March, 2014 Honorary Michael Dunmire Lecture Series.
- Laub, B. G. and P. Budy. 2014. All as one or one for all? Assessing the likely effectiveness of managing three native species (bluehead sucker, flannelmouth sucker, and roundtail chub) as

an ecological complex. American Fisheries Society, Utah Chapter, 11-14 March, 2014, Price, Utah, USA.

Chapman, K., P. Budy, and F. Howe. 2014. Evaluating the potential impacts of American white pelican predation on Bonneville cutthroat trout in Strawberry Reservoir, UT. Poster. American Fisheries Society, Utah Chapter, 11-14 March, 2014, Price, Utah, USA.

Reynolds, Jamie and P. Budy. 2014. The effects of water quality on fish species in Cutler Reservoir. Poster. American Fisheries Society, Utah Chapter, Price, Utah, 12-13 March 2014.

Breen, M.J., G. P. Thiede, P. Budy, M. D. Fiorelli, S. Klobucar, and P. MacKinnon. 2014. Population demographics and habitat criteria for three sensitive fishes: why is the White River unique? American Fisheries Society, Utah Chapter, 11-14 March, 2014, Price, Utah, USA.

Mohn, H., B. Roper, P. Budy. 2014. Quantifying Bonneville Cutthroat Trout spawning movement within the Logan River watershed with consideration to potential metapopulation structure and management. American Fisheries Society, Utah Chapter, 11-14 March, 2014, Price, Utah, USA.

Laub, B. G., J. Jimenez, and P. Budy. 2014. Restoration and monitoring plan for native fish and riparian vegetation on the San Rafael River, Utah. 2014 Spring Runoff Conference, 1-2 April, 2014, Logan, Utah, USA.

Budy, P., M. M. Conner, N.L. Salant, and W. Macfarlane. 2014. The clock is ticking for desert fishes of the SW USA: An occupancy-based assessment of regional vulnerability. American Fisheries Society, Western Division, 7-11 April, 2014, Mazatlán, Mexico.

Klobucar, S.L. and P. Budy. 2014. In hot(ter) water? predictions of arctic char growth and consumption under climate change scenarios on the Alaska North Slope. American Fisheries Society, Western Division, 7-11 April, 2014, Mazatlán, Mexico.

Macfarlane, W.W., P. Budy, G. P. Thiede, and B. G. Laub. 2014. Looking beyond the mainstem for conservation of restoration of endangered Colorado River fishes. American Fisheries Society, Western Division, 7-11 April, 2014, Mazatlán, Mexico.

Mohn, H., B. Roper, P. Budy. 2014. Investigating Bonneville Cutthroat Trout spawning movement within the Logan River watershed with consideration to potential metapopulation structure and management. American Fisheries Society, Western Division, 7-11 April, 2014, Mazatlán, Mexico.

Laub, B. G. and P. Budy. 2014. All as one or one for all? Assessing the likely effectiveness of multi-species management. American Fisheries Society, Western Division, 7-11 April, 2014, Mazatlán, Mexico.

Thiede, G.P., P. Budy, P. MacKinnon, D. Speas, M. Breen, and K. McAbee. 2014. Frequent tributary usage by the endangered and large-river fishes of the Upper Colorado River basin. American Fisheries Society, Western Division, 7-11 April, 2014, Mazatlán, Mexico.

- Budy, P. and Belmont, P. 2014. Understanding wildfire effects on fish populations and stream geomorphology. *Invited Presentation*. UDWR Aquatic Section Meeting, 14 April, 2014, Midway, UT.
- Dibble, K.L., C. B. Yackulic, T. Kennedy, and P. Budy. 2014. Factors influencing the size of salmonids in regulated river systems: a synthesis of data from the Western United States. Joint Aquatic Sciences Meeting; Portland, OR; May 18-23, 2014.
- Finch, C. and P. Budy. 2014. Habitat mediated dispersal and recolonization in stream fish following a severe fire. Poster. Joint Aquatic Sciences Meeting; Portland, OR; May 18-23, 2014.
- Dibble, K.L., C. B. Yackulic, T. Kennedy, and P. Budy. 2014. An examination of the processes that regulate fish size downriver of dams in the Western United States. 144th Annual Meeting of the American Fisheries Society; Quebec City, Canada; August 17-21, 2014.
- Budy, P. and S. Klobucar. 2014. Understanding how lake populations of arctic char are structured and function with special consideration of the potential effects of climate change: a multi-faceted approach. *Invited Presentation*. American Fisheries Society, Alaska Chapter Juneau, Alaska, October, 2014.
- Budy, P. 2015. Why are we doing this and what are we learning: application and context for widespread PIT-tagging efforts in the Upper Colorado River Basin. *Invited Presentation*. Upper Colorado Researchers Meeting, Moab, Utah, January 13-15, 2015.
- Goethlich, J. S.L. Klobucar, D.H. Ogle, and P. Budy. 2015. The effects of experimental lake fertilization on condition and diet of slimy sculpin (*cottus cognatus*) in oligotrophic arctic lakes, North Slope, AK. Annual Meeting, Wisconsin Chapter of the American Fisheries Society, Eau Claire, WI, February 24-26, 2015.
- Budy, P. 2015. Understanding the effects of increased drying (intermittency) on desert fishes of the SW, USA. *Invited Presentation*, International Symposium on Fish Ecology in Intermittent stream systems. Brazilian Society of Ichthyology, January 31- February 8, 2015, Recife, Brazil.
- Klobucar, S.L. and P. Budy. 2015. Consequences of seasonal variation in reservoir water level for predatory fishes: linking visual foraging and prey densities. Annual Meeting, Utah Chapter of the American Fisheries Society, Moab, UT, March 24-25, 2015.
- Malmborg, N., G.P. Thiede, and P. Budy. 2015. Comparing two methods for sampling and estimating abundance of mottled sculpin in the Logan River, Utah. Poster. American Fisheries Society, Utah Chapter, Moab, Utah, March 2015.
- Simmons, L., S. Klobucar, and P. Budy. 2015. Comparison of composition and variation of arctic char diets in a pristine arctic lake system and an artificially fertilized lake. Poster. American Fisheries Society, Utah Chapter, Moab, Utah, March 2015.
- Chapman, K.C., P. Budy, F. Howe. 2014. Evaluating the potential impacts of American white pelican predation on Bonneville cutthroat trout in Strawberry Reservoir, Utah. Annual Meeting, Utah Chapter of the American Fisheries Society, Moab, Utah, 26-28 March 2015.

- Reynolds, Jamie, P. Budy, K. Chapman, and G. P. Thiede. 2015. Understanding the role of non-game fish in pelican diet and distribution at Strawberry Reservoir, UT. American Fisheries Society, Utah Chapter, Moab, Utah, 25 March 2015.
- Budy, P. and W.C. Saunders. 2015. Can high densities of native trout limit expansion of exotic trout through biotic resistance? International Symposium. Advances in the Population Ecology of Stream Salmonids IV. 25-29 May, Girona, Spain.
- Thiede, G.P., H. Mohn, and B. Roper. 2015. International Symposium. Evaluating movement and spatial population structure for stream-dwelling cutthroat trout: implications for management and conservation practices. Advances in the Population Ecology of Stream Salmonids IV. 25-29 May, Girona, Spain.
- Chapman, K. and P. Budy. 2015. Evaluating the potential impacts of pelican predation on cutthroat trout in Strawberry Reservoir, Utah, Annual Meeting of the American Fisheries Society, National; Portland, Oregon, August 17-21, 2015.
- Laub, P. W. Macfarlane, G.P. Thiede and P. Budy. 2015. Looking beyond the mainstem for conservation and restoration of endangered and sensitive Colorado River fishes. Annual Meeting of the American Fisheries Society, National; Portland, Oregon, August 17-21, 2015.
- Strohm, D. and P. Budy. 2015. Matching watershed and otolith chemistry to establish natal origin of an endangered desert lake sucker. Annual Meeting of the American Fisheries Society, National; Portland, Oregon, August 17-21, 2015.
- Klobucar, S.L., J.W. Gaeta and P. Budy. 2015. A changing menu in a changing climate? Predicting the availability of fish food in warmer arctic lakes. 145th Annual Meeting of the American Fisheries Society, Portland, OR, August 16-20, 2015.
- Budy, P. 2015. The Clock is Ticking: An Occupancy-based Assessment of Regional Vulnerability for Desert Fishes of the SW USA. Upper Colorado River Basin Water Forum, Grand Junction CO, 28-29 October 2015.
- Klobucar, S.L., L. Simmons, G.P. Thiede, and P. Budy. 2015. Simplified complexity or complex simplification? Lentic fish communities on the North Slope, Alaska. *Invited presentation*. Annual Meeting, Alaska Chapter of the American Fisheries Society, Homer, AK, 4-6 November, 2015.
- Stout, J.B., M. Conner, P. Budy, M. McKinstry, and P. MacKinnon. 2016. How do we use portable PIT tag antenna data? 37th Annual Researcher's Meeting of the Upper Colorado River Endangered Fish Recovery Program and the San Juan River Basin Recovery Implementation Program. January 12, 2016, Durango, CO.
- Laub, B. G., J. Jimenez, and P. Budy. 2016. An experimental habitat enhancement effort for desert rivers: San Rafael River restoration project. Tamarisk Coalition Meeting, February 9, 2016, Grand Junction, CO.
- Budy, P. 2016. Towards a better understanding of factors that limit and facilitate one of the world's most invasive fishes. *Invited Department Seminar*, University of Wyoming, February 19, 2016, Laramie, WY.

- Laub, B. G., J. Jimenez, and P. Budy. 2016. An experimental habitat enhancement effort for Utah's desert rivers: San Rafael River restoration project. American Fisheries Society, Utah Chapter, March 17, 2016, Altamont, UT.
- Stout, J.B., M. Conner, P. Budy, P. MacKinnon, and M. McKinstry. 2016. Improving our ability to estimate vital rates of endangered fishes on the San Juan River using novel applications of PIT tag technology. American Fisheries Society, Utah Chapter, March 17, 2016, Altamont, UT.
- Maloney, B., J. Gaeta, and P. Budy. 2016. Evaluating habitat-based niche requirements for the bluehead sucker (*Catostomus discobolus*): can we identify the cause of a recruitment bottleneck? American Fisheries Society, Utah Chapter, March 17, 2016, Altamont, UT.
- Hafen, T., G.P. Thiede, and P. Budy. 2016. Temporal and spatial variation in diets of mottled sculpin in the Logan River, Utah. Poster presentation. Utah Chapter, American Fisheries Society Meeting, March 2016, Altamont, UT.
- Simmons, L., S. Klobucar, and P. Budy. 2016. Big fish in a small pond or small fish in a small pond? Investigating arctic char dimorphism with consideration of predator-prey interactions. Utah Chapter, American Fisheries Society Meeting, March 2016, Altamont, UT.
- Wright, E., G.P. Thiede, and P. Budy. 2016. Determining long-term trends in trout populations using standard stream electrofishing methods: Is the extra pass worth it? Poster presentation. Utah Chapter, American Fisheries Society Meeting, March 2016, Altamont, UT.
- Dorathy, J., G.P. Thiede, and P. Budy. 2016. Two is better than one: using multiple methods to improve mottled sculpin density estimates in the Logan River, Utah. Poster presentation. Utah Chapter, American Fisheries Society Meeting, March 2016, Altamont, UT.
- Lucas, H., B. Maloney, G.P. Thiede, and P. Budy. 2016. Ageing and growth of bluehead sucker in the Weber River, Utah. Poster presentation. Utah Chapter, American Fisheries Society Meeting, March 2016, Altamont, UT.
- Klobucar, S.L., J.W. Gaeta and P. Budy. 2016. A changing menu in a changing climate? Predicting the availability of fish food in warmer arctic lakes. Annual Meeting of the Western Division of the American Fisheries Society, March 22, 2016, Reno, NV.
- Budy, P. 2016. Arctic Lakes: Where are we in the current project? Where are we going? Arctic LTER Annual Meeting 2016, Woods Hole Marine Biological Station, April 6, 2016, Woods Hole, MA.
- Budy, P. 2016. Annual Research Productivity Update: Highlights and Management Implications of 21 Different Research Projects in 2015 in QCNR. Utah Cooperative Fish and Wildlife Research Unit Annual 11Cooperator Coordinating Meeting, Utah State University, April 27, 2016, Logan, UT.
- Budy, P. 2016. Understanding the effects of increased drying on desert rivers and fishes: how can we avert the "perfect storm"? *Honorary Speaker for 2016: Portneuf Subunit of the Idaho Chapter of the American Fisheries Society*. Idaho State University, April 28, 2016, Pocatello, ID

- Klobucar, S.L., and P. Budy. 2016. Consequences of seasonal variation in reservoir water level for predatory fishes: linking visual foraging and prey densities. *Invited Presentation*, Symposium "water Regulation and Reservoir Management in a context of global climate change". Annual Summer Meeting of the Association for the Sciences of Limnology and Oceanography, June 6, 2016, Santa Fe, NM.
- Budy, P., S. Klobucar, L. Winters, D. Strohm, and G.P. Thiede. 2016. Crowded reservoir trophic niche space under a warmer, drier climate. *Invited Presentation*, Symposium "Water Regulation and Reservoir Management in a context of global climate change". Annual Summer Meeting of the Association for the Sciences of Limnology and Oceanography, Santa Fe, NM, June 5-10, 2016.
- GaetaStout, J. andB., P. Budy. , M. Conner, P. MacKinnon, and M. McKinstry. 2017. Reservoir and Lake Fish Dynamics under a climate Improving our ability to estimate vital rates of change and multi-year drought. Leadersendangered fishes on the San Juan River using novel applications of *Invited Symposium*, Western Division,PIT tag technology. Joint Meeting of the Colorado-Wyoming and Utah Chapters of the American Fisheries Society. Grand Junction, CO. February 22, 2017.
- Maloney, B., P. Budy, and J. Gaeta. 2017. Evaluating optimal rearing habitat for the Bluehead Sucker (*Catostomus discobolus*). Oral presentation. Joint meeting of the Colorado-Wyoming and Utah Chapters of the American Fisheries Society, February 2017, Grand Junction, CO, USA.
- Thiede, G.P., P. Budy, and B. Laub. 2017. The effect of lake level on forage and Lahonton Cutthroat Trout in Pyramid Lake, Nevada. Invited Symposium: Resiliency and Vulnerability of Lentic Ecosystems and Communities to Climate Change and Multi-year Drought: What is known and what remains Annual ConferenceMeeting of the Western Division of the American Fisheries Society, 23 May, 2017, Missoula, MT.
- Laplanche, C., G.P. Thiede, and P. Budy. 2017. Modelling the invasion and management of brown trout in the Logan River, Utah. Annual Meeting of the Western Division of the American Fisheries Society, 24 May, 2017, Missoula, MT.
- Gaeta, J. and P. Budy. Invited Symposium Leaders: Resiliency and Vulnerability of Lentic Ecosystems and Communities to Climate Change and Multi-year Drought. Western Division, American Fisheries Society Annual Conference, Missoula, MT, May 22-25.
- Budy, P., S. Klobucar, L. Winters, D. Strohm, and G.P. Thiede. 2017. Crowded reservoir trophic niche space: likely influences of a warmer, drier climate? , MayInvited Symposium: Resiliency and Vulnerability of Lentic Ecosystems and Communities to Climate Change and Multi-year Drought: What is known and what remains. Annual Meeting of the Western Division of the American Fisheries Society, 23 May, 2017, Missoula, MT.
- Stout, J.B., P. Budy, M. Conner, P. MacKinnon, and M. McKinstry. 2017. Wanted: Dead or Alive. Determining fish status from mobile PIT antenna detection data. 42nd Annual Meeting of the Western Division of the American Fisheries Society. Missoula, MT. May 22, 2017.
- Maloney, B., P. Budy, and J. Gaeta. 2017. Do spawning and rearing habitat contribute to the recruitment bottleneck of imperiled Bluehead Sucker (*Catostomus discobolus*)? Oral

Presentation. Annual Meeting of the Western Division of the American Fisheries Society, May 2017, Missoula, MT, USA.

Laub, B. G., D. Blythe, and P. Budy. 2017. Understanding Multiple Impacts of Hydrologic Alteration on Native Fish Communities in the Rio Grande, Texas and Mexico. American Fisheries Society, Western Division, Annual Meeting, Missoula, Montana, 22-25. May 2017.

Blythe, D.E. and P. Budy. 2017. Has an altered hydrologic regime changed ecosystem function and impacted the native fish biodiversity of the Rio Grande? Presentation. ESA Annual Meeting, Portland, Oregon, August 7-11 2017.

Budy, P. D. Blythe, B. Maloney, J. Schmidt, and T. Blythe. 2017. The ecological context of flow related issues in the Rio Grande/Rio Bravo: Bi-national Rio Grande Forum. 7 November, 2017. El Paso, Texas.

Budy, P. 2017. Towards a better understanding of one of the world's worst invasive fishes. *Invited Dept. of Ecology Seminar*. Montana State University, Bozeman, MT. 7 December, 2017.

PROFESSIONAL SERVICE & ACTIVITIES

Editor, 2017 – present, Ecology of Freshwater Fish.

Associate Editor, 2010 – present, Ecology of Freshwater Fish.

American Fisheries Society, Education Section, Western Division Representative, 2014-present.

American Fisheries Society & Sea Grant Best Student Paper/Poster Symposium. May 2014.

American Fisheries Society, Professional Networking Opportunity, Presentation and Roundtable for students etc., Utah Chapter, Price, UT, 12 March, 2014.

Assistant Director, Intermountain Center for River Rehabilitation and Restoration, Utah State University, Logan, UT, 2006 – 2011.

Scientific Expert and Panel Reviewer, U.S. Bureau of Reclamation (BOR) facilitated review of “*Effects of a selective withdrawal structure at Glen Canyon Dam on temperature degree days for fish, fish parasites, and selected invertebrates and algae of the Colorado River in Grand Canyon*”. September, 2011.

Science Panel Member and Invited Presenter, Comparative Survival Study (Columbia River Salmon - Hydrosystem) Workshop, Silverton, OR, July 26-28, 2011.

Scientific Expert, Lake trout Suppression Workshop II. “The Yellowstone Lake Crisis: Confronting a Lake Trout Invasion. An Interim Scientific Assessment. Chico Hot Spring Resort, MT, June 14-16, 2011 .

Invited Expert External Review. NFWF Stream Restoration Review of “Promoting Successful Restoration through Effective Monitoring in the Chesapeake Bay Watershed. Draft Report prepared for National Fish and Wildlife Foundation. May 15 – June 1, 2011.

Budy, Program Chair and Convener. International Symposium, Advances in the Population Ecology of Stream Salmonids, Lueca (Asturias, Spain), May, 17-21, 2010.

Co-Chairs: Budy and Burnett. ‘Brown trout in the West’. Special Symposium, American Fisheries Society, Western Division, Salt Lake City, UT, April 20-23, 2010.

Co-Chairs: Al-Chokhachy and Budy. ‘Small river advances in PIT-tags and capture-recapture: from field data to analyses to application in fisheries research and monitoring’. Special Symposium, American Fisheries Society, Western Division, Salt Lake City, UT, April 20-23, 2010.

Research Grade Evaluation Panelist, US Geological Survey, New Orleans, LA, March 2010.

International External Examiner. PhD Thesis “Riverscape-mediated effects on introduced trout on native galaxiid fishes in New Zealand” University of Canterbury, Christchurch, New Zealand, April, 2009.”

Scientific Expert, Lake Trout Suppression Workshop I. “A Comprehensive Appraisal of Long-Term Suppression of Lake Trout in Yellowstone Lake.” Chico Hot Spring Resort, MT, August 25-29, 2008.

Associate Editor, 2006-2008. North American Journal of Fisheries Management.

Past President, Bonneville Chapter of American Fisheries Society, (2003 - Elected Vice President, 2004 - President Elect, 2005 - President). Program Chair for annual meeting, 2004.

Eugene Maughan Graduate Student Scholarship Selection Committee member, Western Division American Fisheries Society, 2005-2007.

Member, American Fisheries Society

USFWS Bull Trout Research, Monitoring, and Evaluation Technical Team. 2003-present. Workshop I, Welches, OR, 2001, Workshop II, Portland, OR, 2003, Workshop III, Boise, ID, 2004, Workshop IV, Portland, OR, 2005, Workshop V, Whitefish, MT, 2006. Workshop VI, Portland, OR, 2007.

Member, Ecological Society of America

Assistant Program Chair, Ecological Society of America, 1997.

Trout Unlimited - Cache Anglers (participation is in an educational capacity)

Board of Directors, Western Regional Aquaculture Center 2002-2007.

External Reviewer, University of Nebraska-Lincoln School of Natural Resources program review for the Cooperative State Research, Education, and Extension Services (CSREES).

Proposal Review Panelist, USDA, Cooperative State Research Education and Extension Service, Integrated Water Quality Program, Washington DC, June 2005.

Research Grade Evaluation Panelist, US Geological Survey, Anchorage, AK, September 2005.

COURSES TAUGHT

Utah State University, College of Natural Resources, Watershed Sciences Department , Graduate Induction Class, lake fish ecology, 2014 – Jackson Lake, WY, 2015 – Bear Lake, UT.

Fish Diversity and Conservation (WATS 3100 lecture, 3110 laboratory). Utah State University, College of Natural Resources, Watershed Sciences Department, 2008, 2009, 2010, 2012, 2013, 2014, 2015 (Co-taught with J. Gaeta).

Graduate Population Ecology (FRWS 6400). Utah State University, College of Natural Resources, 2006.

Graduate Population Assessment (WS 6550 and Bonneville chapter of AFS short course). Utah State University, Department of Watershed Sciences. 2001, 2003, and 2005.

Large River Management (WS 6330). Utah State University, 2002. Co-taught with J. Schmidt.

Graduate Fish Ecology (WS 6230/7230). Utah State University, Department of Watershed Sciences. 2002, 2004, and 2006.

Principles of Stream Restoration – Part I, Utah State University, Department of Watershed Sciences. Co-taught with J. Schmidt and P. Wilcox. 5-day short course. 2003, 2004, 2005, 2006, 2007, 2008, 2010.

POST-DOCTORAL FELLOWS ADVISED

Miller, S. 2008 - 2009. Advancing the Science and Practice of River Restoration. Intermountain Center for River Rehabilitation and Restoration. *Co-Advised with Jack Schmidt.*

Salant, N. 2009 - 2011. Advancing the Science and Practice of River Restoration. Intermountain Center for River Rehabilitation and Restoration. *Co-Advised with Jack Schmidt.*

Saunders, W.C. 2010 - 2013. 1) A test of the theory of biotic resistance: novel options for native fish restoration. 2) Understanding the invasion success of a novel predator: burbot life history and trophic interactions in Flaming Gorge Reservoir.

Dibble, K.L., C. B. Yackulic, T. Kennedy, and P. Budy. 2014-2015. Factors influencing the salmonids in regulated river tailwaters: a synthesis of data from the Western United States.

Laub, B. 2012 – present (*now a full time Research Scientist and Adjunct Faculty*). Conservation applications for imperiled desert fishes: identifying restoration potential of desert rivers.

Schorr, Robert. 2016 – 2017. Analytical assessment of the status of endangered fishes in the Upper Colorado River Basin.

VISITING SCHOLAR COLLABORATION

Dr. E. Becares, Dpt. of Ecology, University of Leon, Spain, (2014, 2015)

Dr. G. Gonzales, Ichthios Environmental & Dpt. of Ecology, University of Leon, Spain (2015)

Dr. C. La Planche, Ecole Nationale Supérieure d'Agronomie de Toulouse, Castanet-Tolosan, France, (2016, 2017).

GRADUATE STUDENTS ADVISED

THESES AND DISSERTATIONS COMPLETED

1. McHugh, Peter. 2002. A model-based approach to assessing the potential response of chinook salmon to habitat improvements. MS Thesis. Fisheries Biology. Utah State University.
2. de la Hoz Franco, Ernesto A. 2003. Assessing the effects of *Myxobolus cerebralis* and other environmental factors on the dynamics, abundance, and distribution of endemic trout populations in the Logan River, Utah. MS Thesis. Ecology. Utah State University.
3. Haddix, Tyler. 2004. Factors affecting growth of rainbow trout in Flaming Gorge Reservoir, Utah-Wyoming. MS Thesis. Fisheries Biology. Utah State University.
4. Vatland, Shane. 2005. Food web dynamics and predator-prey cycles in Lake Powell, AZ-UT. MS Thesis. Ecology. Utah State University.

5. McHugh, Peter. 2006. A multi-scale assessment of brown trout (*Salmo trutta*) – cutthroat trout (*Oncorhynchus clarkii utah*) interactions in Bonneville Basin streams. PhD Dissertation. Ecology. Utah State University.
6. Al-Chokhachy, Robert. 2006. Understanding and quantifying the factors that limit bull trout abundance and survival. PhD Dissertation. Ecology. Utah State University.
7. Homel, Kristen. 2006. Understanding differences in genetic and environmental determinants of life-history stage in threatened bull trout. MS Thesis. Fisheries Biology. Utah State University.
8. Birchell, Garn. 2007. The effects of non-native Colorado River cutthroat trout following the removal of invasive brook trout from a small headwater stream in Utah. MS Thesis. Fisheries Biology. Utah State University.
9. Hansen, Eriek. 2007. Evaluating the effectiveness of passive stream restoration for improving native fish health and reducing the impacts of whirling disease. MS Thesis. Ecology. Utah State University.
10. Wood, Jeremiah. 2008. An investigation of the early life-history of exotic brown trout (*Salmo trutta*) and potential influences on invasion success. MS Thesis. Fisheries Biology. Utah State University.
11. Nadolski, Benjamin. 2008. Movement patterns and multi-scale factors that influence exotic brook trout distribution and abundance. MS Thesis. Fisheries Biology. Utah State University.
12. Dahle, Kirk S. 2009. Understanding the abiotic and biotic factors that determine fish abundance and diversity along the gradient of a highly altered stream ecosystem. MS Thesis. Ecology. Utah State University.
13. Bottcher, Jared. 2009. Maintaining population persistence in the face of an extremely altered hydrograph: Implications for three sensitive fishes in a tributary of the Green River, UT. MS Thesis. Watershed Science. Utah State University.
14. Seidel (Wood), Sara. 2009. Spawning ecology and early-life history of imperiled, endemic cutthroat trout. MS Thesis. Fisheries Biology. Utah State University.
15. Walsworth, Timothy. 2011. A patch approach to understanding the effect of stream degradation on food web and population structure of imperiled desert fishes. MS Thesis. Ecology. Utah State University.
16. Meredith, Christy. 2012. Effects of a changing physical template on the longitudinal distribution of brown trout in a mountain stream: implications for brown trout invasion success. PhD. Ecology. Utah State University.
17. Bowerman, Tracy. 2013. A multi-scale investigation of factors limiting bull trout viability. PhD. Ecology. Utah State University.
18. Klobucar, Stephen. 2013. An experimental and modeling approach to understanding predator-prey dynamics: identifying limitations of predator performance in high desert impoundments. MS Thesis. Ecology. Utah State University.

19. Winters, Lisa. 2014. An evaluation of the food web dynamics and predator prey interactions in Scofield Reservoir. MS Thesis. Ecology. Utah State University.
20. Dean, Andy. 2014. An evaluation of the relative performance of diploid versus triploid brook trout with consideration of the influence of lake characteristics. MS Thesis. Ecology. Utah State University.
21. Heredia, Nicholas. 2014. Trophic status, energetic demands, and factors affecting Lahonton cutthroat trout distribution in Pyramid Lake, Nevada. MS Thesis. Ecology. Utah State University.
22. Strohm, Deanna. 2015. Matching watershed and otolith microchemistry to establish natal origins of an endangered desert lake sucker. MS Thesis. Ecology. Utah State University.
23. Mohn, Harrison. 2016. Improving management and conservation practices of Bonneville cutthroat trout (*Onchorhynchus clarkii Utah*) through an evaluation of movement and spatial population structure. Co-advised with Brett Roper. MS Thesis. Ecology. Utah State University.
24. Maloney, Bryan. 2017 *In progress*. Evaluating habitat-based niche requirements for the imperiled bluehead sucker (*Catostomus discobolus*): can we identify the cause of identifying potential recruitment bottleneck? bottlenecks. Co-advised with Jereme Gaeta. MS Thesis. Ecology. Utah State University. *Slated date of completion: Spring 2017.*

IN PROGRESS

25. Chapman, Kevin. Evaluating the potential direct and indirect impacts of American white pelican predation on Bonneville cutthroat trout in Strawberry Reservoir, Utah. MS Thesis. Ecology. Utah State University. *Defended. Slated date of completion: Unknown.*
26. Klobucar, Stephen. *In progress*. Understanding how arctic lake fish populations and communities are structured and function with special consideration of the potential effects of climate change. PhD Dissertation. Ecology. Utah State University. *Slated date of completion: January 2018.*
27. Finch, Colton. *In progress*. Fires, floods, and fish: projecting population recovery in an inland watershed.. PhD Dissertation. Ecology. Utah State University. *Slated date of completion: Spring 2018.*
28. Stout, Benjamin. Improving our ability to estimate vital rates of endangered fishes on the San Juan River using novel applications of PIT tag technology. Co-advised with Mary Conner. MS Thesis. Ecology. Utah State University. *Slated date of completion: Spring 2018.*
29. Blythe, Demitra. *In progress*. Assessing the food web structure and ecological function relative to the historical condition of the Rio Grande in the Big Bend region. MS Thesis. Ecology. Utah State University. *Slated date of completion: Spring 2018.*
30. Newlon, Courtney. *in progress*. Identifying cues for movement and temporally-dynamic limiting factors in the bull trout movement corridor. *Slated date of completion: Spring Fall 2017.*

UNDERGRADUATE RESEARCH PROJECTS ADVISED

- Hafen, T. 2018. Ecological effects of lake characteristics and arctic char presence on cohabiting native fish assemblage structure and fish size, diet, and growth. Oral presentation at the Utah Chapter of the American Fisheries Society meeting, March 2018. Ogden, UT.
- Arnold, T. 2018. Using non-lethal fin ray analysis to determine growth rates of spawning and non-spawning walleye (*Sander vitreus*) in Willard Bay Utah. Oral presentation at the Utah Chapter of the American Fisheries Society meeting, March 2018. Ogden, UT.
- Shamo, T. 2018. Examining relationships between barometric pressure and lunar cycle on angler catch rates in the Logan River, Utah. Oral presentation at the Utah Chapter of the American Fisheries Society meeting, March 2018. Ogden, UT.
- West, R. 2018. Potential drivers of diet and spatial variation of sculpin in the Logan River, Utah. Poster presentation at the Utah Chapter of the American Fisheries Society meeting, March 2018. Ogden, UT.
- Nichols, K. 2018. Evaluating diet overlap between cutthroat trout and brown trout held in experimental enclosures under differing densities: can native trout at higher densities resist nonnative trout impacts. Poster presentation at the Utah Chapter of the American Fisheries Society meeting, March 2018. Ogden, UT.
- Hafen, T. 2016. Temporal and spatial variation in diets of mottled sculpin in the Logan River, Utah. Poster presentation at the Utah Chapter, American Fisheries Society Meeting, March 2016, Altamont, UT.
- Simmons, L. 2016. Big fish in a small pond or small fish in a small pond? Investigating arctic char dimorphism with consideration of predator-prey interactions. Oral presentation at the Utah Chapter, American Fisheries Society Meeting, March 2016, Altamont, UT. NSF Research Experience for Undergraduates Scholar. Awarded USU URCO Research grant.
- Wright, E. 2016. Determining long-term trends in trout populations using standard stream electrofishing methods: Is the extra pass worth it? Poster presentation at the Utah Chapter, American Fisheries Society Meeting, March 2016, Altamont, UT.
- Dorathy, J. 2016. Two is better than one: using multiple methods to improve mottled sculpin density estimates in the Logan River, Utah. Poster presentation at the Utah Chapter, American Fisheries Society Meeting, March 2016, Altamont, UT.
- Lucas, H. 2016. Ageing and growth of bluehead sucker in the Weber River, Utah. Poster presentation at the Utah Chapter, American Fisheries Society Meeting, March 2016, Altamont, UT.
- Malmborg, N. 2015. Comparing two methods for sampling and estimating abundance of mottled sculpin in the Logan River, Utah. Poster presentation at the Utah Chapter, American Fisheries Society Meeting, March 2015, Moab, UT. "Best Poster" Award Winner. USU QNCR Travel grant application submitted 2015.

- Reynolds, J. 2015. Understanding the role of non-game fish in pelican diet and distribution at Strawberry Reservoir, UT. Prepared for presentation at the Utah Chapter, American Fisheries Society Meeting, March 2015, Moab, UT and USU Student Showcase, 2015. Successfully competed for USU QCNR Travel grant and USU Honors Research for Undergraduates grant.
- Simmons, L. 2015. Trophic position and niche-space dynamics of apex predators in arctic lakes. USU URCO Grant Application Submitted 2, 2015. Poster presentation at the Utah Chapter, American Fisheries Society Meeting, March 2015, Moab, UT. USU URCO Research grant application submitted 2015.
- Hafen, K. 2014. Agonistic behavior between rainbow, cutthroat, and tiger trout in a novel Utah reservoir community. *PUBLISHED*: Hafen, K. and P. Budy. 2015 Agonistic behavior among three stocked trout species. *North American Journal of Fisheries Management, Management Brief*: 35:3, 551-556. USGS FSP: IP-058150.
- Hafen, K. 2014. Agonistic behavior between rainbow, cutthroat, and tiger trout in a novel Utah reservoir community. *PUBLISHED*: Hafen, K. and P. Budy. 2015 Agonistic behavior among three stocked trout species. *North American Journal of Fisheries Management, Management Brief*: 35:3, 551-556. USGS FSP: IP-058150.
- Reynolds, Jamie. 2013. Effects of water quality on fish species in Cutler Reservoir. Undergraduate Honors Thesis*. Quinney College of Natural Resources, USU. Presented at Utah American Fisheries Society and The Wildlife Society, March 2014.
- Roholt, B. 2013. A morphometric determination of gape limitation of top fish predators in the western US. Watershed Sciences, USU.
- Ausberger, J. 2013. Sculpin diet composition in the Logan River. Quinney College of Natural Resources, USU. Research Experience for Undergraduates Program.
- Fisher, K. 2013. Comparing Trophic Level Position of Invertebrates In Fish And Fishless Lakes In Arctic Alaska. Undergraduate Honors Thesis. USU. 14 pp.
- Gordon, W. 2011. Effects of large-scale removal of brown trout (*Salmo trutta*) on the diet and condition of trout in Right Hand Fork. Watershed Sciences, USU.
- Hafen, K. 2011. Do small impoundments serve as a source for rapid recolonization of riverine habitat after large-scale removal of exotic brown trout (*Salmo trutta*) from the Logan River? Wildlife Resources, USU.
- Rowley, G. 2010. Prey selection and diet selectivity of introduced brook trout in high Uinta mountain lakes: implications for food web dynamics. Completion report: Gilbert will be a co-author on a manuscript to be submitted as *North American Journal of Fisheries Management*.
- Chaston, R. 2010. Abundance, condition, and habitat use of brown trout in the Right Hand Fork tributary, Utah: lessons for brown trout management. Presented as a Poster at Utah (formerly Bonneville) Chapter of the American Fisheries Society, 2010 Annual Meeting.

- Olsen, D. 2009. An analysis of agonistic behavior patterns in diploid and triploid brook trout. WATS, 3 Credits. Project complete. Devin will be a co-author on a manuscript to be submitted as North American Journal of Fisheries Management, Management Brief.
- Crozier, H. 2008. Stabilization of reservoir, as a mitigation project associated with enlargement of Big Sand Wash Reservoir (In the Uintah Basin) and the Central Utah Project. Summer Internship, WILD, 3 credits. Power Point Presentation.
- Wallace, C. 2006. Examining the ontogenetic diet shift of black crappie in Cutler Reservoir, Utah. WATS, 3 Credits. Presented as a Poster at Bonneville Chapter, American Fisheries Society, Annual Meeting, 2006. Awarded \$805 (CNR) for work and travel to a meeting.
- Pearce, W. 2006. Assessing the age structure, fecundity, life span, and recent, apparent declines in the Utah chub population in Strawberry Reservoir, Utah. Presented as a Poster at Bonneville Chapter of the American Fisheries Society, 2007 Annual Meeting.
- VanDyke, E. 2005. An assessment of the feeding relations between introduced trout in the Logan River: an ontogenetic perspective. Presented as a Poster at Bonneville Chapter of the American Fisheries Society, 2005 Annual Meeting. Awarded \$500 from URCO and \$400 from CNR for this research. Co-authored McHugh et al. 2008.

GRADUATE COMMITTEE ADVISEMENT (OTHERS) - CURRENT

Susan Wasko, MS, WATS
 Samuel Lyster, MS, WATS
 Maggie Kraft, MS, WATS

MNR GRADUATE COMMITTEE ADVISEMENT - CURRENT

{The master of natural resources (mnr) degree is designed specifically for natural resource working professionals who are returning to school to advance their careers}.

Cody Edwards, Utah Division of Wildlife Resources, Fisheries
 Calvin Black, Utah Division of Wildlife Resources, Fisheries
 Clint Brunson, Utah Division of Wildlife Resources, Fisheries
 Seth Elsen, Hood Canal Salmon Enhancement Group
 Michael Fiorelli, Utah Division of Wildlife Resources, Fisheries

ACADEMIC SERVICE

USU, Quinney College of Natural Resources representative. Chemical Hygiene Committee. 2017.

USU, East Campus. East Gateway District Plan Faculty Committee. 2017.

USU, WATS, Undergraduate Degree and Curriculum Revision Committee, 2015-2016.

USU, Honors Application Review Committee, 2015.

USU, Quinney College of Natural Resources, Undergraduate Scholarship Committee, 2015.

USU, College of Natural Resources, Faculty and Staff Academic Awards Committee (2011,2012,2013,2014, 2015).

USU, New Faculty Teaching Academy, Teaching Mentor for: Karin Kettenring, 2008, Joseph Wheaton, 2009, Patrick Belmont, 2010, Jereme Gaeta, 2015.

USU, Watershed Sciences, Fish Ecologist Faculty Search Committee (2014).

USU, Watershed Sciences, Aquatic Geographer Faculty Search Committee (2010).

USGS, CRU 2009 Award Nominating Committee (2010).

Invited External Dissertation Examiner. D. Woodford, PhD. 2009. University of Canterbury, Christchurch, New Zealand. "River-scape Mediated Effects of Introduced Trout on native Galaxiid Fishes in New Zealand."

USU, Watershed Sciences, Watershed Scientist Faculty Search Committee (2009).

USU, Watershed Sciences, Spatial Ecologist Faculty Search Committee (2008).

USU, Watershed Sciences, Wetland Scientist Faculty Search Committee (2007).

USU, College of Natural Resources, WATS representative, College Seminar Committee (2007).

USU, Undergraduate Research and Creative Opportunities (URCO), Grant Selection Committee (2006-2007).

USU, College of Natural Resources, Quinney Library Improvement Committee (2006).

USU, Department of Watershed Sciences, GIS/ Riparian Ecologist Faculty Search Committee (2004).

USU, Department of Watershed Sciences, Graduate Academic Review Committee (2001-2004).

USU, College of Natural Resources, Search Committee for new Dean of Natural Resources (2005).

USU, College of Natural Resources, Educational Policy Committee (2001-2004).

USU, College of Natural Resources, Graduate Fellowship Advisory Committee (2002-2004).

USU, Water Initiative Seminar Series Committee (2003-2005).

TECHNICAL TRAINING PROVIDED

Utah Department of Natural Resources (DNR): Climate Change Introductory Workshop II. Budy & Edwards, Coordinators. Workshop provided to DNR Employees and Selected Officials from the Governor's office, upon request including three selected USU professors from different disciplines. Utah DNR Building, SLC, UT. 14 May, 2014.

Utah Division of Wildlife Resources: Climate Change Introductory Workshop I. Budy & Edwards, Coordinators. Workshop provided to UDWR Biologists and Upper Administration upon request including four selected USU professors from different disciplines and one USFS invited scientist. Utah DWR Building, SLC, UT. 18 April, 2014

Instructor - Continuing Education Short Course, for Utah Chapter of American Fisheries Society, 2007. Coordinated by Student Sub-Unit, Bioenergetics in fisheries: concepts and applications.

Coordinator - Continuing Education Short Course, USU, Departments of WS and FWRS. 2006, 2007. MARK Mark-Resight Workshop. Mary Conner- Instructor.

Instructor - Continuing Education Short Course, for Bonneville and WY/CO chapters of American Fisheries Society, 2003. Animal Population Assessment.

Instructor - Continuing Education Short Course, for Bonneville Chapter of American Fisheries Society and the Wildlife Society, 2001. Animal Population Assessment.

TECHNICAL TRAINING RECEIVED

February 2013. US Geological Survey - Supervisory Challenges Course. Sacramento, CA, January 28 - February 1, 2013.

August 2009. Structured Decision Making, US Fish and Wildlife Service. National Conservation Training Center, Shepherds Town, WV, August 24-28, 2009.

June 2001. Program MARK Workshop. Sponsored by the Wildlife Management Institute and taught by Dave Anderson, Ken Burnham, Colorado Cooperative Fish and Wildlife Unit, and Gary White, Colorado State University.

May 1999. Mastering Microsoft Visual Basic 6.0 Fundamentals.

May 1998. USDOJ Motorboat operator certification course.

SELECTED OUTREACH ACTIVITIES

Bonneville cutthroat trout conservation video. Produced by the Quinney College of Natural Resources and also showed on UDWR Facebook page, where it reached >20,000 people on May 9: <https://www.facebook.com/UtahDWR/videos/1257954494215560/>. 2016.

The Native American Summer Mentorship Program- 25 Undergraduates from the Navajo Tribe. Field Trip to USU. Lab visit to Budy Fish Ecology Lab: 1) explained the lab and structure: what do we do, fish and ecology research studies, 2) described some projects in Utah: some hands on items (pelican puke, PIT tags), and 3) described undergrad opportunities in detail: technician work, undergraduate research. 9 May, 2016.

Featured on UDWR Facebook/Blog: “Mapping the Tushar mountain streams from above”
<http://wildlife.utah.gov/blog/2015/mapping-the-tushar-mountain-streams/>, 15 February, 2015.

Featured in USU Magazine: Arctic Research and Lab undergraduate researcher:
<http://www.usu.edu/magazine/>.

Featured on UDWR Facebook/Blog: “The Twitchell Canyon Fire”
<http://wildlife.utah.gov/blog/2014/the-twitchell-canyon-fire/>, 14 November, 2014.

Featured on UDWR Facebook/Blog: “Trout vs. chub”. <http://wildlife.utah.gov/blog/2014/trout-vs-chub/>, 15 July, 2015.

Research Brief – Utah: USGS Coop Catch-Up Newsletter: “The Twitchell Canyon Fire”. November, 2014.

Featured on UDWR Facebook/Blog: Pelican predation on cutthroat trout research at Strawberry Reservoir:
https://www.facebook.com/UtahDWR/photos/?tab=album&album_id=839890476021966, 11 July, 2014

Research Brief – Utah: USGS Coop Catch-Up Newsletter: “Curbing the chub: usu aquatic ecologist works to restore balance” March, 2015. Issue 68.

Budy Fish Ecology Lab led field trip for USU Subunit of the American Fisheries Society: Sampling trip to Scofield Reservoir to determine if the stocking of cutthroat trout and tiger trout are helping decrease the population of Utah chub in the reservoir. Students received hands-on experience in field research and data collection as they record lengths, weights and extract stomach samples from the fish they caught. 16 February, 2013.

Invited Presentation, Cache Anglers Chapter of Trout Unlimited. 2011. Saunders, W.C., P. Budy, G. Thiede. Brown trout demographics in the Logan River: effects of mechanical removal and potential for biotic resistance limit brown trout expansion. Logan, UT. January 19, 2011.

Invited Presentation to UDWR --Blue Ribbon Fisheries Advisory Council. 2011. Budy, P. “Long term monitoring of trout on the Logan River: why is monitoring important?” UDWR, Salt Lake City, UT. March 10, 2011.

Invited Presentation to UDWR –Bonneville Cutthroat Trout Range-Wide Coordination Group. 2010. Budy, P., G.P. Thiede, and A. Dean. “An evaluation of the relative performance of diploid and triploid trout with consideration of the effects of lake morphology and fish density” UDWR, Salt Lake City, UT. November 3, 2010.

Invited Presentation to UDWR –Bonneville Cutthroat Trout Range-Wide Coordination Group. 2010. Saunders, W.C., P. Budy, and G. Thiede. 2010. Bonneville Cutthroat Trout Restoration in the Logan River. Invited Presentation, Bonneville Cutthroat Trout Recovery Team, Salt Lake City, UT, November 3, 2010.

Invited Presentation to UDWR –Three Species Annual Conservation Team. 2010. “Four Years of Study on the San Rafael River: where have we come and where are we going?” Budy. P., G.P. Thiede, and T. Walsworth. UDWR, Salt Lake City, UT. October 27, 2010.

Invited Presentation to NGO as part of an environmental film series. 2009. “Challenges for conserving and protecting Utah’s fishes”. Presented at Swaner EcoCenter, Park City, UT, July 15, 2009.

Invited Presentation to NGO as part of an environmental film series. “Challenges for conserving and protecting Utah’s fishes”. Presented at Swaner EcoCenter, Park City, UT, July 15, 2009.

Invited Presentation to Cache Anglers, Local Chapter of Trout Unlimited. “Eight years of trout research on the Logan River: what have we learned? Options for BCT restoration” Presented in Logan, UT, June 10, 2009.

Lead a field trip and presented field stream-side presentation to the Spawn Creek Passive Restoration and Research Study Site located in Logan Canyon, UT for the Trout Unlimited national convention, held at Snowbird, UT (September 11-14, 2008).

State Volunteers and Education. Working with the Utah Division of Wildlife Resources Dedicated Hunter program. Volunteers provide about 130 - 180 volunteer hours, and we educate them about our projects and the goals of the project. They also receive information about my fish ecology lab and on-going research, and basics of fish biology, ecology, and conservation (via actions, demonstrations, and handouts). Annual.

‘Evaluating the effectiveness of stream bank and riparian protection in restoring the water quality, stream habitat, and fish community of an important trout, spawning stream: Spawn Creek, Utah’. *Presentation to*: Public as invited and coordinated by the Utah Watershed Coordinating Council. Phaedra Budy, Eriek Hansen, and Gary Thiede, March 19, 2008.

Earth Day Environmental Explorations. On the Watershed Sciences Department at Utah State University conducted an Earth Day activity involving environmental explorations for two Cache Valley high schools. As part of the Earth Day event, the Fish Ecology Lab of the Utah Cooperative Fish and Wildlife Unit, demonstrated fish sampling techniques including electrofishing, stomach pumping for stomach content analysis and fish tagging. We then discussed the information we gained from sampling, answered questions, and discussed a few bigger picture issues about the environment in general. We interacted with seven groups of between 5-8 students. April 22, 2008.

Bear River Watershed Festival, American West Heritage Center, April, 2002, 2003, 2004, 2005, and 2007. Booth with a live exhibit of native and introduced fishes of the Bear River, undergraduate poster presentation of the fishes of the Bear River and games for children.

“*Testing the Waters: Scientists Continue Study of the Logan River*”. The Herald Journal. Newspaper article about Logan River project. Friday, August 15, 2008.

“*Shocking (for) Results*”. The Herald Journal. Newspaper article about Logan River project. Friday, August 17, 2007.

HONORS, AWARDS, and RECOGNITION

USGS/DOI Star Award. 2017 Superior Performance (\$1,825 + 24 extra hours of annual leave). November, 2017.

USU S.J. and Jessie E. Quinney, College of Natural Resources, Large and Notable Grant Recipient Award. Research Week Awards Gala. April, 2016.

USGS/DOI Star Award. 2016 Superior Performance (1% of salary). November, 2016.

USU S.J. and Jessie E. Quinney, College of Natural Resources, Large Grant Recipient Award. Research Week Awards Gala. April, 2015.

USGS/DOI Star Award. 2015 Superior Performance (1% of salary). January 13, 2014.

American Fisheries Society, Honoree for "Ladies Night", Hosted by the Equal Opportunity Section and the Student Subsection of the American Fisheries Society, 2014. Award highlights the positive impact women have had on AFS and on fisheries science by showcasing the contributions of female researchers, both past and present.

USGS/DOI Star Award. 2011 Superior Performance (\$1595). November 21, 2011.

USGS/DOI Star Award. 2010 Superior Performance (\$3807). November 15, 2010.

Utah State University, College of Natural Resources. 2009 Researcher of the Year.

Utah State University, College of Natural Resources. 2009 Teacher of the Year.

USGS/DOI Star Award. 2009 Superior Performance (\$2,945).

Advance, NSF, Travel Fellowship, 2008, (\$1000) matched by Dept. of WATS (\$1000)

Utah Chapter American Fisheries Society, 2007 Scientist of the Year, Awarded March 2008.

USGS/DOI Star Award. 2007 Superior Performance (\$1300).

USGS/DOI Star Award. 2006 Superior Performance (\$1600).

Utah State University, College of Natural Resources. 2006 Undergraduate Mentor of the Year (included monetary award).

USGS/DOI Star Award. 2005 Superior Performance (\$1537).

Utah State University, Department of Fisheries and Wildlife, Faculty Advisor of the Year, 2002.

US Department of the Interior, Star Award awarded for outstanding contribution on Washington DC briefings and presentations (\$2000).

US Department of the Interior, On the Spot Award awarded for outstanding contribution (\$1000).

CURRENT RESEARCH PROJECTS

CURRENT, PRIMARY, ONGOING RESEARCH PROJECTS

2016- 2021. Budy, P., A. Giblin, B. Crump, S. Null, J. Jin. **Collaborative research: an exploration of the direct and indirect effects of climatic warming on arctic lake ecosystems.** National Science Foundation: Office of Polar Programs. \$999,335.

2015- present. **Assessing the State of River Science, Water Resources Management, and Water Resources Planning Tools for the Rio Grande / Rio Bravo.** Principal Investigators: P. Budy and J. Schmidt. US Geological Survey, Total Award to date \$131,725.

2010-present **Arctic LTER: Climate Change** and Changing Disturbance Regimes in Arctic Landscapes: LAKES. Principal Investigator: Budy. National Science Foundation (NSF), UDWR, Total Award to date \$192,000.

2015- present. **Adaptive management with and installation and development of methods and analyses for PIT tag technology and data.** Principal Investigators: Budy and Conner. Bureau of Reclamation (DOI), \$650,000.

2013-present Understanding the effects of **wildfire on fish** populations and stream geomorphology in **Twitchell Canyon.** Principal Investigator: Budy. Utah Division of Wildlife Resources, UDWR, Total Award to date \$209,556.

2012-present **San Rafael River Restoration** Science: Restoration Implementation & Monitoring.

2015- present. **Weber River, Bluehead Sucker** Recruitment Bottleneck Study. Utah Division of Wildlife Resources, UDWR, Total Award to date: \$128,221.

2013-2016. Quantifying **pelican predation potential** on the fish community of **Strawberry Reservoir** (UDWR) & Cutthroat Trout Restoration (USFS- RMRS). Principal Investigator: Budy. Utah Division of Wildlife Resources, UDWR, USFS, Total Award to date \$190,345.

2011-present Evaluating cutthroat trout performance and identifying limiting factors for the native fish community of **Pyramid Lake.** Phaedra Budy (PI), Utah State University, USFWS, Great Basin Cooperative Ecosystem Unit (CESU), 2011-present, Total Award \$394,769.

2011-present Tributary habitat use of endangered and imperiled fishes in the **Price River,** Utah. Phaedra Budy (PI). Bureau of Reclamation (BOR), Activities to Avoid Jeopardy Program, Total Award to date \$166,452.

2011-2015. Movement and Habitat Studies of Endangered Fishes in the **Colorado River Basin.** Bureau of Reclamation (BOR), Activities to Avoid Jeopardy Program, Total Award to date \$233,769.

2002-present Limiting factors affecting trout population dynamics, abundance, and distribution in the **Logan River,** Utah: population dynamics, disease, and synergistic effects. Principal Investigator: Budy. Utah Division of Wildlife Resources, UDWR, Total Award to date \$714,454.

2002-present **Bull trout** population assessment and life-history characteristics in association with habitat quality and land use: template for recovery planning. Principal Investigator: Phaedra Budy. US Fish and Wildlife Service (USFWS),RWO, Total Award to date \$1,515,024.