
2005 ANNUAL REPORT
USGS Biological Resources Division
Utah Cooperative Fish and Wildlife Research Unit
College of Natural Resources
Utah State University, Logan UT 84322-5290



2006 Coordinating Meeting
College of Natural Resources
Utah State University
12 April 2006



Utah State
UNIVERSITY



Utah Department of
Natural Resources
Division of Wildlife
Resources



USGS Biological Resources
Utah Division of Wildlife Resources
CNR Utah State University
Wildlife Management Institute
U. S. Fish & Wildlife Service

2006
Annual Coordinating Committee Meeting
Utah Cooperative Fish and Wildlife Research Unit
College of Natural Resources
Dean's Conference Room, NR 108
Utah State University, Logan, UT

*Rotating Chair: 1992:USU, 1993:NBS, 1994:UDWR, 1995:WMI, 1996:USU, 1997:USGS,
1998:UDWR, 1999:WMI, 2000:USU, 2001:USGS, 2002:UDWR, 2003:WMI, 2004:USU,
2005:USGS, 2006:UDWR*

Theme: Managing Tight Budgets and a Declining Workforce

Wednesday, 12 April 2006

AM

9:00-9:45	Continental Breakfast (Dean's Conference Room NR 108)
9:45-10:00	Introductions and Meeting Overview
10:00-11:00	2004 Unit Productivity (<i>J. Bissonette, T. Edwards, P. Budy</i>)
11:00-12:00	Student Posters and Interactions with Students
12:00-1:30	Catered Lunch in the CNR Atrium

PM

1:30-3:00	Discussion: <u>Finding and retaining natural resource professionals</u>
3:00-5:00	Agency Updates: Activities and Initiatives <u>College of Natural Resources</u> – <i>Dean Nat Frazer</i> (National Cooperative Coalition), <i>Department Heads: Chris Luecke, Johan du Toit, Terry Sharik</i> <u>U. S. Geological Survey</u> <i>Bern Shanks</i> -- Cooperative Research Units Program <u>U.S. Fish and Wildlife Service</u> <i>Terry Sexson</i> (region), <i>Lucy Jordan</i> (state) <u>Utah Division of Wildlife Resources</u> <i>Director & UDWR personnel</i>
5:00	Departure

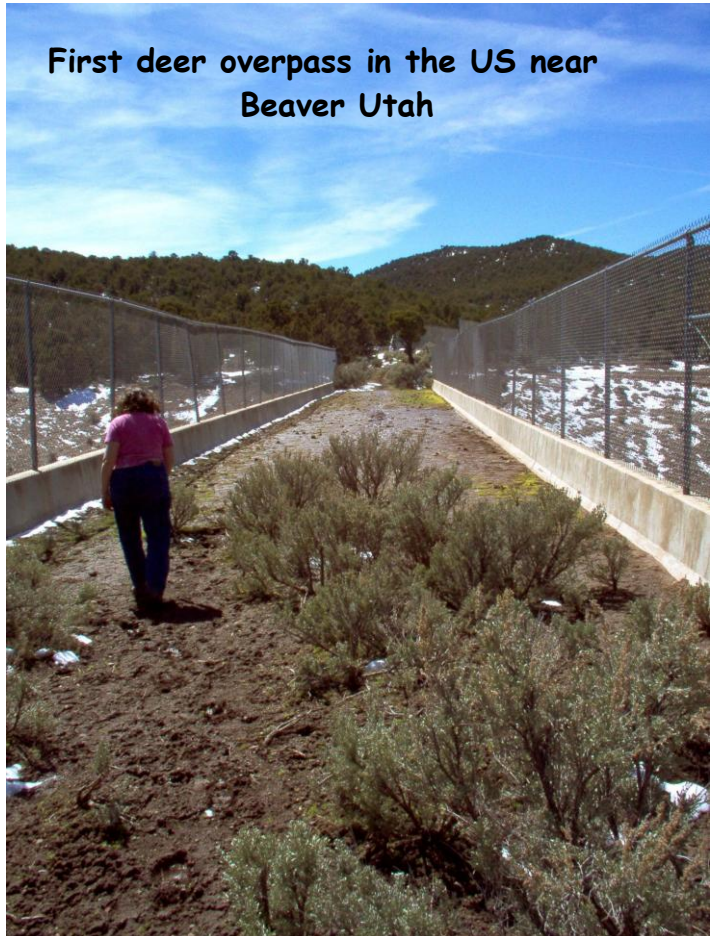
2005 ANNUAL REPORT

USGS Biological Resources Division Utah Cooperative Fish and Wildlife Research Unit College of Natural Resources Utah State University, Logan UT 84322-5290

Cutler Reservoir Walleye



**First deer overpass in the US near
Beaver Utah**



Spawn Creek, Logan River



**2005 Research Activities of the Unit Staff
John A. Bissonette
Thomas C. Edwards
Phaedra E. Budy**

Personnel

Cooperators – Coordinating Committee

United States Geological Survey

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Mission Statement
Utah Cooperative Fish and Wildlife Research Unit
2005

The major limiting influences upon fishery and wildlife resources in the Intermountain West are terrestrial habitat degradation and loss and watershed and water issues. Loss of winter range for big game, degradation and loss of riparian areas by agricultural practices, loss of wildlife rangeland habitat by practices such as sagebrush removal and the planting of cattle forage, as well as change of reservoir and riverine habitat through activities associated with hydroelectric and water delivery systems are the major factors that have and will continue to affect natural resource management in Utah in years to come. Rapid population growth in the state has exacerbated the pressures on both the terrestrial and aquatic resource. Given these trends and the expertise of Unit personnel, the primary mission of the Unit is to address food web and habitat related problems relating to the fishery and wildlife resources of Utah and the Intermountain West.

Cooperating Faculty in the Department, College, and University are, and will continue to be, integrated into Unit research to apply diverse expertise to all facets of a research problem. In addition to the more traditional fields of biological endeavor, expertise in geographical information systems, expert systems, artificial intelligence, sociological science, survey methodology, chemical and contaminant analysis, and computer modeling and methodology, as well as other pertinent fields, can be brought to bear on resource problems. The primary motivation of the Unit is to solve pressing resource problems.

Technical expertise of the Unit staff includes: larger scale dynamics, geographical information system and habitat restoration methodology, terrestrial habitat analysis, population management and assessment, aquatic habitat ecology, fish population dynamics, aquatic food web dynamics, and quantitative study design. Our research activities focus on landscape-level habitat studies, ecological modeling of lake, reservoir, and riverine systems, and avian and terrestrial ecology. Future research directions of the Unit will continue to involve endangered fish and wildlife species, sustainable game and sport fish management, terrestrial and aquatic riparian studies, migratory non-game bird research, and geographical information system methodology, and landscape-level studies involving modeling for future scenarios.

Graduate level courses being taught by unit personnel at Utah State University include Design and Analysis of Ecological Research (emphasizes the research process), Topics in Spatial Ecology (emphasizes space from an ecological as well as statistical perspective), and Assessment of Fish and Wildlife Populations (emphasizes sampling design and estimation of abundance and survival). Unit personnel are increasingly involved in continuing education/professional advancement short courses for agency personnel.

The Unit is committed to academic pursuit of cooperator interests, and in particular, the needs of the Utah Division of Wildlife Resources. Yet, the strength of the Unit is directly related to its ability to attract outside funds. Research done in the state and region with non-cooperator funds provides added benefits to cooperators. This Unit has and will continue to address resource issues associated with its expertise to the benefit of Utah and the resource management community. Our primary objective is quality science.

Unit Productivity
USGS Utah Cooperative Fish and Wildlife Research Unit Productivity
2005

PUBLICATIONS

Book

Bissonette, J. A., and I. Storch, eds. 2006 (expected) *Wildlife Response to Resource Discontinuities: The Importance of Time*. Springer-Verlag, New York and Heidelberg.

Scientific Papers

Al-Chokhachy, R., Budy, P. 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.

Bissonette, J. A. 2005. Thinking differently at larger ecological scales: Developing a workable strategy. Pages 66-81 in *Proceedings of the 12th Annual Conference of the Australasian Wildlife Management Society, "Old Ways, New Ways; Wildlife Management in Northern Australia"*. ISBN: 0 9757614 71.

Busch, G., R. J. Lilieholm, R. E. Toth, and T. C. Edwards, Jr. 2005. Alternative future growth scenarios for Utah's Wasatch Front: assessing the impacts of development on the loss of prime agricultural lands. *Transactions on Ecology & the Environment* 80:247-256.

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.

Cramer, P.C., and J. A. Bissonette. 2005. Wildlife crossings in North America: The state of the science and practice. Pages 442-337 in: *International Conference on Ecology and Transportation 2005 Proceedings*, Center for Transportation and the Environment, North Carolina State University, NC, U.S.A.

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.

Edwards, T. C., Jr., Cutler, R., N. E. Zimmermann, L. Geiser, and J. Alegria. 2005. Model-based stratifications for enhancing the detection of rare ecological events. *Ecology* 86:1081-10903.

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.

- Lawler, J. J., and T. C. Edwards, Jr. 2005. A variance-decomposition approach to investigating multi-scale habitat associations. *Condor* 108:47-58.
- 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.
- McHugh, P., and P. Budy. 2005. 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.
- Meyers, P., W. D. Ostrand, M. Conover, and J. A. Bissonette. 2005. Effect of perch sites on mourning dove nest distribution. *Western North American Naturalist* 65(1):64-69.
- McClure, M. F., J. A. Bissonette, and M. R. Conover. Migratory strategies, fawn recruitment, and winter habitat use by urban and rural mule deer (*Odocoileus hemionus*). 2005. *European Journal of Wildlife Research* 51:170-177. Published Online First 11 May 2005.
- Zakrajsek, E. J., and J. A. Bissonette. 2005. Ranking the risk of wildlife species hazardous to military aircraft. *Wildlife Society Bulletin*. 33(1):258-264.

In Press

- Edwards, T. C., Jr., D. R. Cutler, N. E. Zimmermann, L. Geiser, and G. G. Moisen. Effects of underlying sample survey designs on the utility of classification tree models in ecology. Accepted, *Ecological Modelling*.
- Moisen G. G., E. A. Freeman, J. A. Blackard, T. S. Frescino, N. E. Zimmermann, and T. C. Edwards, Jr. Predicting tree species presence and basal area in Utah: a comparison of stochastic gradient boosting, generalized additive models, and tree-based methods. Accepted, *Ecological Modelling*.
- Vatland, S., P. Budy, and G. P. Thiede. *In press*. An approach to modeling striped bass and threadfin shad predator-prey dynamics in Lake Powell, Utah-Arizona. Invited chapter for Special Peer-Reviewed American Fisheries Symposium Series Book. *Accepted February 13, 2006*.

Submitted, and in Review

- Zimmermann, N. E., Moisen, G. G., Edwards, T. C., Jr., Frescino, T. S., and J. A. Blackard. Testing the partial contributions of remotely-sensed and topo-climatic predictors for tree species modelling in Utah. In review, *Journal of Applied Ecology*.
- Kassar, C., and J. A. Bissonette. Data issues in describing road mortality hotspots and creating predictive models: A case study of Utah. In revision, *Landscape Ecology*

- Kassar, C., and J. A. Bissonette. An assessment of costs associated with deer-vehicle collisions: It's more than just road kill. In revision, *Human Dimensions of Wildlife*.
- Johnson, E. J., T. L. Wilson, and J. A. Bissonette. High-elevation sagebrush meadows: substitute for or supplement to low-elevation sagebrush habitat? In review, *The Auk*
- Johnson, J. A., B. A. Andres, and J. A. Bissonette. Distribution, abundance, and habitat associations of birds during the breeding season at major mainland rivers of southeastern Alaska. In review, USFWS Report Series publication.
- Bunnell, K. D., M. L. Wolfe, J. A. Bissonette, and J. T. Flinders. In Review. Predicting the landscape level impacts of snow-mobiles and coyotes to potential lynx habitat in Utah and the intermountain west. In review, *Landscape ecology*.
- Loureiro, F., J. A. Bissonette, D. W Macdonald, & M. Santos-Reis.. Pulsed resources in Mediterranean habitats: are they real and do badgers track them? In revision, *EJWM*.
- Wilson, T. L, E. J. Johnson, and J. A. Bissonette. Are high-elevation sagebrush-dominated meadows a refuge for sagebrush-obligate and -associated small mammals? In review, *Western North American Naturalist*
- Wilson, T. L, Johnson, E. J., and Bissonette, J.A. Landscape supplementation and shrub-steppe associated bird species in a patchy, mountainous landscape. In revision
- McHugh, P., and P. Budy. Exotic brown trout affect the individual- and population-level performance and dietary habits of native cutthroat trout. *Oecologia*. In review, *Transactions of the American Fisheries Society*.
- Budy, P. and H. Schaller. Predicting the effects of freshwater restoration on the overall survival of salmon: how much is enough? In review, *Ecological Applications*.

TECHNICAL & SEMI-TECHNICAL PAPERS

- Bissonette, J. A., and P. Cramer. 2005. Evaluation of the use and effectiveness of wildlife crossings. Interim Report prepared for the National Academy of Sciences (Transportation Research Board-National Cooperative Highway Research Program. 50 pages with 10 Appendices.
- Budy, P., R. Al-Chokhachy, K. Homel, and G. P. Thiede. 2005. Bull trout population assessment and life-history characteristics in association with habitat quality and land use in the Walla Walla River Basin: a template for recovery planning. 2004 Annual Progress Report to US Fish and Wildlife Service.

- Budy, P., P. McHugh, E. Hansen, and G. P. Thiede. 2005. Logan River study: factors affecting trout population dynamics, abundance, and distribution in the Logan River, Utah. Project XIII, Annual Report to Utah Division of Wildlife Resources.
- Budy, P., S. Vatland, and G. P. Thiede. 2005. Lake Powell food web dynamics. Annual Report to Utah Division of Wildlife Resources. Project XIV. Grant Number F-47-R. Salt Lake City, Utah.
- Cramer, P., S. Rosa, and J. A. Bissonette. 2006. Condition of Highway 91 Wildlife Underpasses, Escape Ramps, and Fencing in Sardine Canyon, Wellsville Mountains, Utah, Winter 2006. Project Report No. 1. USGS Utah Cooperative Fish and Wildlife Research Unit, Utah State University, Logan Utah. 2006(1):1-20.
- Edwards, T. C., Jr., G. G. Moisen, T. S. Frescino, and R. J. Schultz. 2005. The application of FIA-based data to wildlife habitat modelling: a comparative study. Pages 7-11 *in* Proceedings of the Fourth Annual Forest Inventory and Analysis Symposium, New Orleans, Louisiana, USA, R. E. McRoberts, G. A. Reams, P. C. Van Deusen, W. H. McWilliams, and C. J. Cieszewski, Eds. General Technical Report NC-252, North Central Research Station, USDA Forest Service, St. Paul, Minnesota, USA.
- Kassar, C., and J. A. Bissonette. 2005. Deer-vehicle crash hotspots in Utah: Data for effective mitigation. UTCFWRU Project Report No. 2005(1):1-128. Utah Cooperative Fish and Wildlife Research Unit, Utah State University, Logan Utah. (website: <http://www.cnr.usu.edu/faculty/jbissonette/index.htm>)
- Schultz, R. J., T. C. Edwards, Jr., G. G. Moisen, and T. S. Frescino. 2005. Development and validation of spatially explicit habitat models for cavity-nesting birds in Fishlake National Forest, Utah. Pages 241-249 *in* Proceedings of the Fourth Annual Forest Inventory and Analysis Symposium, New Orleans, Louisiana, USA, R. E. McRoberts, G. A. Reams, P. C. Van Deusen, W. H. McWilliams, and C. J. Cieszewski, Eds. General Technical Report NC-252, North Central Research Station, USDA Forest Service, St. Paul, Minnesota, USA.

THESES AND DISSERTATIONS COMPLETED:

J. A. Bissonette

- Kassar, C. A. 2005. Wildlife vehicle collisions in Utah: An analysis of wildlife road mortality hotspots, economic impacts, and implications for mitigation and management. M.S. Thesis, Utah State University.
- Johnson, E. 2005. Bird and small mammal communities of sagebrush-dominated mountain meadows: An examination of meadow characteristics as part of a hierarchical, multi-level study of the Wasatch-Cache National Forest. M.S. Thesis, Utah State University.

Wilson, T. 2005. Contributions of high elevation sagebrush-steppe habitats to bird and mammal biodiversity across the intermountain west. M.S. Thesis, Utah State University.

T. C. Edwards, Jr.

Busch, G. A. 2005. Development and validation of a logistic regression-based urban growth model for Utah's Greater Wasatch Area. M.S. Thesis, Utah State University.

DeBloois, D. 2005. Training workshops in the design and analysis of research for use in the management of State of Utah wildlife resources. M.S. Thesis, Utah State University.

P. Budy

Vatland, S. 2005. Food web dynamics and predator-prey cycles in Lake Powell, AZ-UT. MS Thesis. Utah State University.

Al-Chokhachy, R. 2006. Understanding and quantifying the factors that limit bull trout abundance and survival. Ph.D. Dissertation, Utah State University.

PAPERS AND POSTERS PRESENTED

Invited

Bissonette, J. A. 2005. Taking the road less traveled: The importance of scaling indirect effects allometrically. Invited presentation for the Symposium titled "Reducing habitat fragmentation by roads: A comparison of measures and scales", INTECOL-ESA 2005 Joint Meeting, Montreal Canada, August 2005.

Bissonette, J. A. 2005. Time: The neglected dimension in landscape ecology. Invited seminar to the Central Science Laboratory, Department for Environment, Food, and Rural Affairs, York, Great Britain, August 2005.

Bissonette, J. A. 2005. Creating networks for large-bodied animals in fragmented landscapes. Invited Plenary Session Presentation for the Symposium titled: Habitat Networks for Large Wildlife and Habitat Fragmentation, 27th Congress of the International Union of Game Biologists, Hannover, Germany, August 2005.

Bissonette, J. A. 2005. Scaling wildlife crossings: Getting the distance right. Invited Presentation given at the University of Freiburg, November 2005.

Bissonette, J. A. 2005. Biodiversity issues: Is the world getting better. Class with I. Storch presented at the University of Freiburg, November 2005.

- Budy, P. 2005. Putting together the pieces of the puzzle: a template for the recovery of a threatened fish. Invited Seminar, University of Maine, Orono, Department of Fish and Wildlife.
- Budy, P. 2005. Water in the west, use-abuse-and scarcity: Fisheries management in Utah. Invited Seminar, College of Natural Resources Annual NR Week Symposium; co-sponsored by the College of Natural Resources and the USU Water Initiative.
- Budy, P. 2006. Understanding the synergistic effects of disease, species interactions, and environmental variation on the survival and persistence of an imperiled trout. Invited Seminar, Oregon State University, Corvallis, Dept. of Fisheries and Wildlife.
- Budy, P. 2006. Understanding the food web interactions and role of a new invader in a large, western reservoir. Invited Seminar, The Ohio State University- Columbus, Dept. of Evolution, Ecology, and Organismal Biology.
- Busch, G., R. J. Lilieholm, R. E. Toth, and T. C. Edwards, Jr. Assessing the Impacts of urban development on the loss of prime agricultural lands along Utah's Wasatch Front. Invited paper, 5th International Conference on Ecosystems and Sustainable Development, Cadiz, Spain, June 2005.
- Cramer, P. and J. A. Bissonette 2005. Wildlife and roads: The state of the science and practice. Invited presentation from the Southern Rockies Ecosystem Project to present the paper at the Rockies Wildlife Crossing Field Course, Payson Arizona, April 2005.
- Cramer, P. C. and J. A. Bissonette. 2006. NCHRP 25-27 Update: Evaluation of the Use and Effectiveness of Wildlife Crossings in North America. Invited presentation to the Transportation Research Board Wildlife and Highways Workshop. Washington, D.C. January 2006.
- Cramer, P. C. and J. A. Bissonette. 2006. Priorities for research related to wildlife and roads. Invited presentation to the Transportation Research Board Wildlife and Highways Workshop. Washington, D.C. January, 2006.
- Cramer, P. C. and J. A. Bissonette. 2006. Wildlife crossings in North America. Invited presentation to the Transportation Research Board Wildlife and Highways Workshop. Washington, D.C. January, 2006.
- Cramer, P. C. and J. A. Bissonette. 2006. The use and effectiveness of wildlife crossings. Invited presentation to the Natural Resources Law Forum at the Wallace Stegner Center for Land, Resources and the Environment, S. J. Quinney College of Law, University of Utah, Salt Lake City, UT, February 2006.
- Cramer, P. C. and J. A. Bissonette. 2006. Wildlife and roads: The state of the science and practice. Invited presentation to the 2006 MN.DOT Environmental Stewardship and Streamlining Workshop, Minneapolis, MN, March 2006

Lilieholm, R. J., R. E. Toth, and T. C. Edwards, Jr. 2005. The Impact of Alternative Future Growth Scenarios on Open Space Conservation along Utah's Wasatch Front. Invited paper, 2nd International Conference on Sustainable Planning & Development, Bologna, Italy, September 2005.

Contributed

Al-Chokhachy, R. , P. Budy, and M. Conner. 2005. Salmonid Conservation and Monitoring: Understanding the Accuracy and Costs of our Efforts. American Fisheries Society, National Meeting, Anchorage, AK.

Budy, P. and H. Schaller. 2005. Predicting the effects of freshwater restoration on the overall survival of salmon: how much is enough? American Fisheries Society, National Meeting, Anchorage, AK.

Budy, P., G. P. Thiede, and P. McHugh. 2005. Modeling the synergistic effects of physical factors, disease, and species interactions on the survival and status of endemic cutthroat trout. 11th Annual Whirling Disease Symposium, Denver, CO.

Cramer, P. C., J. A. Bissonette, N. Newhouse, T. Kinley, K. Knapp, B. Persaud, C. Lyon, I. Brakop, T. Clevenger, And S. Jacobson. 2005. Restoring permeability to the roaded landscape: Priorities for research. Presentation US-IALE, Syracuse N.Y. 2005 meeting, March 2005.

Cramer, P. C., and J. A. Bissonette. Wildlife crossings in North America: The state of the science and practice. International Conference on Ecology and Transportation (ICOET), San Diego, August 2005.

Cramer, P.C., and J. A. Bissonette. 2005. NCHRP 25-27 update: Wildlife crossings in North America. Deer-Vehicle Crash Reductions: Setting a Strategic Agenda Workshop. University of Wisconsin, Madison, Wisconsin, October, 2005.

Edwards, T.C., Jr., N. E. Zimmerman, G.G. Moisen, T. S. Frescino, J. A. Blackard. Testing the partial contributions of remotely sensed and topo-climatic predictors for tree species habitat modeling in Utah. Paper presented at the Seventh Annual Forest Inventory and Analysis Symposium, Portland, Maine, October 2005.

Edwards, T. C., Jr., D. R. Cutler, and K. Beard. Predictive modelling of invasive plants on National Park lands: a preliminary analysis. Paper presented at the National Park Service Annual Inventory and Monitoring Meeting, Seattle, Washington, October 2005.

Edwards, T. C., Jr. Shrubsteppe monitoring and avian species management. Presented paper, 2005 Meeting of the Utah Partners in Flight, Sherwood Hills, Utah, April 2005.

Hansen, E., P. Budy, G. P. Thiede. 2006. Evaluating the effectiveness of passive stream restoration for improving native fish health and reducing the impacts of whirling disease. 12th Annual Whirling Disease Symposium "War of the Whirls". Denver, Colorado.

- Homel, K. and P. Budy. 2005. The influence of abiotic and biotic factors on the movement patterns of bull trout (*Salvelinus confluentus*) in Northeast Oregon. Bonneville Chapter of American Fisheries Society, Garden City, UT.
- Homel, K. and P. Budy. 2005. Evaluating genetic variation between life-history forms of bull trout (*Salvelinus confluentus*) in Northeast Oregon. American Fisheries Society, National Meeting, Anchorage, AK.
- Kassar, C., and J. A. Bissonette. 2005. Identifying and describing road mortality hotspots: When is it necessary to be spatially explicit? Presentation US-IALE, Syracuse N.Y. 2005 meeting, March 2005.
- McHugh, P. and P. Budy. 2005. An experimental assessment of the multi-scale effects of exotic brown trout on native Bonneville cutthroat trout. Bonneville Chapter of American Fisheries Society, Garden City, UT.
- McHugh, P. and P. Budy. 2005. An experimental assessment of the multi-scale effects of exotic brown trout on native Bonneville cutthroat trout. American Fisheries Society, National Meeting, Anchorage, AK.
- Moisen, G. G., E. A. Freeman, J. A. Blackard, T. S. Frescino, N.E. Zimmerman, T. C. Edwards, Jr. Predicting tree species presence and basal area in Utah: a comparison of stochastic gradient boosting, generalized additive models, and tree-based methods. Paper presented at the Seventh Annual Forest Inventory and Analysis Symposium, Portland, Maine, October 2005.
- Rosa, S., and J. A. Bissonette. 2005. How to teach a mule deer to safely cross an interstate highway: Preliminary results of a wildlife mortality mitigation strategy on Interstate 15 in Utah, USA. Poster, International Conference on Ecology and Transportation (ICOET), San Diego, August 2005.
- Thiede, G.P., P. Budy, and P. McHugh. 2005. Factors affecting the status of endemic cutthroat trout in the Logan River, Utah. Bonneville Chapter of American Fisheries Society, Garden City, UT.
- VanDyke, E. and P. Budy. 2005. An assessment of the feeding relations between native and introduced trout in the Logan River: an ontogenetic perspective. Bonneville Chapter of American Fisheries Society, Garden City, UT. Undergraduate Research Project Sponsored by U.R.C.O (Undergraduate Research & Creative Opportunities- USU [\$500]) and CNR (\$400).
- Vatland, S., and P. Budy. 2005. Lake Powell (Utah-Arizona) food web dynamics: the effects of newly introduced gizzard shad. American Fisheries Society, National Meeting, Anchorage, AK.

Vatland, S., P. Budy, and G. Thiede. 2005. Potential effects of gizzard shad on the pelagic food web of Lake Powell, Utah-Arizona: a bioenergetics approach. Bonneville Chapter of American Fisheries Society, Garden City, UT.

Wilson, T. L., E. J. Johnson, and J. A. Bissonette. 2005. Supplementation and sagebrush habitat specialists in patchy mountainous landscapes. Presentation US-IALE, Syracuse N.Y. 2005 meeting, March 2005.

Zarnetske, P. S., T. C. Edwards, Jr., and G. G. Moisen. Modeling forest bird species' likelihood of occurrences with FIA and LANDFIRE vegetation models and generated pseudo-absence points. Paper presented at the Seventh Annual Forest Inventory and Analysis Symposium, Portland, Maine, October 2005.

Zarnetske, P. S.**, T. C. Edwards, Jr., and G. G. Moisen. Modelling forest bird species habitat with known presence points and generated psuedo-absence points in Utah. Paper presented at the 90th Annual Meeting of the Ecological Society of America, Montreal, Canada, August 2005.

**Winner of the 2005 E. Lucy Braun Award for the Best Student Poster, Ecological Society of America.

CLASSES AND SHORT COURSES

J. A. Bissonette

FW6700/7700, Landscape Ecology, 3 credit hours, graduate class, Winter Semester 2005, 22 students.

Landscape Ecology Short Course, 2 weeks, Albert-Ludwigs-Universität, Freiburg Germany 29 Nov. - 9 Dec. 2005.

T. C. Edwards, Jr.

FRWS 6500, Design and Analysis of Ecological Research, 4 credit hours, Fall 2005, graduate class, 23 students.

P. Budy

AWER 6660, Population Assessment, 3 credit hours, Spring 2005, graduate class, 11 students.

The principles and practice of stream restoration. Coordinator and Co-Instructor- Continuing Education Short Course, Dept. of Aquatic, Watershed, and Earth Resources, USU. May 30- June 3, 2005.

RECOGNITION & AWARDS

J. A. Bissonette

National Cooperative Research Units Recognition Star Award, US Department of Interior, Superior Performance. 2005.

T. C. Edwards, Jr.

National Cooperative Research Units Recognition Star Award, US Department of Interior, Superior Performance. 2005.

P. Budy

National Cooperative Research Units Recognition Star Award, US Department of Interior, Superior Performance. 2005.

Students

(2005)

Gary Thiede chosen as CNR employee of the year 2005

Kris Homel, Western Division AFS Sustainable Fisheries Award, 2005, \$300.

Phoebe Zarnetsky, M.S. student, Winner of the 2005 E. Lucy Braun Award for the Best Student Poster, Ecological Society of America, 2005.

Chris Kassar, M. S. Student, awarded NASA-MSU Professional Enhancement Award March 2005 International Association for Landscape Ecology

Shauna Leavitt, Coop Unit Administrative Assistant, Hubbard Scholarship for Environmental Creative Writing, College of Humanities, Arts, and Social Sciences, 2005

(2006 January – April)

Phoebe Zarnetsky, M.S. student, best Poster Award, Utah Chapter TWS meeting, Moab, UT March 2006

Silvia Rosa, M. S. student, Best Student Paper , 3rd Place, Utah Chapter TWS Meeting, Moab UT March 2006, and \$500 student scholarship from the UT Chapter of TWS

Patty Cramer, Coop Unit Research Associate, Best Professional Presentation, 2nd place, Utah Chapter TWS Meeting, Moab, March 2006.

Tammy Wilson, Ph.D. Student, awarded NASA-MSU Professional Enhancement Award March 2006 International Association for Landscape Ecology

2006Bonneville Chapter AFS conference in Park City

Chris Homel, M.S. student, Best Overall Poster Presentation (\$500 travel scholarship),

Eriek Hansen, \$1000 tuition scholarship to attend the USU Stream Restoration Short-course

Tarita Harju, Best Student Oral Presentation (\$500 travel scholarship) (Mark Vinson student)

SPECIAL ASSIGNMENTS

J. A. Bissonette

Deutsche Forschungsgemeinschaft Mercator Visiting Professor at Albert-Ludwigs-Universitaet Freiburg (Germany), 15 September-30 December 2005

Chair, Admissions Committee, Forestry, Range, and Wildlife Sciences Department, USU

T. C. Edwards

Statistical Advisory Group, USDA Forest Service.

Survey and Management Program, Pacific Northwest Forest Management Plan.

P. Budy

Bull Trout Research, Monitoring, and Evaluation Technical Team, USFWS Region 1.

USU, College of Natural Resources, Dean Search Committee, Federal Collaborator Representative.

Board of Directors for the Western Regional Aquaculture Center, Utah Representative.