Jonathan W. Cummings

Post-Doctoral Fellow

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**EDUCATION**

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| --- | --- |
| Doctor of Philosophy, Natural Resources, University of Vermont, 3.89 GPA | 2014 |
| Masters of Resource Management, Simon Fraser University, 3.89 GPA | 2009 |
| Bachelor of Arts, Biology & Environmental Studies, Oberlin College, 3.30 GPA | 2005 |

**RESEARCH INTERESTS**

Structured Decision Making, Management Strategy Evaluation, quantitative ecology, decision analysis, fish and wildlife management, decision support, population viability, data visualization, biodiversity

**RESEARCH EXPERIENCE**

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| **Post-Doctoral Fellow**, School of Marine Science and Technology, University of Massachusetts Dartmouth, New Bedford, MA | 2018 – Present |
| Identifying New England ground-fish management objectives and management actionsConducting a management strategy evaluation to supply decision support to the New England ground-fish management plan development team.Creating an interactive webpage to communicate predicted management action outcomes.Reviewing management strategy evaluations against best decision making practices |
| **Research Ecologist**, Patuxent Wildlife Research Center, US Geological Survey, Laurel, MD | 2014 – 2017Grade: 12 Series:0408 |
| Assisted with species status assessments for use in endangered species decisions.Awarded the Department of Interior STAR award for lesser prairie-chicken population viability analysisFacilitated expert elicitation workshop and produced a workshop report on lynx status Research supports implementation of the endangered species act.Decision analysis for selection of an endangered species act implementation strategy. |
| **PhD Dissertation,** University of Vermont, Burlington, VT | 2009-2014 |
| *Decision Support for Wildlife Management.* Research included value of information analyses for spatial data and efficient use of resources for estimates of harvested population status.Developed relational databases and access frontend to store and interact with Vermont Fish and Wildlife Department dataUtilized Structured Decision Making to improve natural resource managementConducting research to develop cost-effective wildlife monitoring programs |
| **Master’s Degree Project,** Simon Fraser University, Burnaby, BC, Canada | 2006-2009 |
| *The Impact of Management Objectives and Performance Measures on Model Selection for Fraser River Sockeye Salmon*.Research assisted prediction of in-river mortality and use of the predictions to fisheries management |
| **Independent Study Project,** SIT Study Abroad, Cairns, QLD, Australia | 2005 |
| *Reforested Rainforest Invertebrate Community: Development of the invertebrate community in reforested plots at Lake Barrine National Park* |

**PUBLICATIONS**

**Cummings, JW**, C Bernier. Structured Decision Making provides insight when selecting a preferred population monitoring program. *In* Harvest of Fish and Wildlife: Sustainable Management in a Challenging World. Kevin L. Pope and Larkin A. Powell, editors. In Press.

**Cummings, JW**, M Parkin, J Zelenak, H Bell, K Broderdorp, B Holt, M McCollough, T Smith. 2020. Applying expert elicitation of viability and persistence to a lynx species status assessment. Conservation Science and Practice. <https://dio.org/10.1111/csp2.284>

**Cummings, JW,** SJ Converse, DR Smith, S Morrey, M Runge. December, 2018. Analyzing implicit decision framing, an unrecognized source of confusion in endangered species classification decisions. Conservation Biology <https://doi.org/10.1111/cobi.13185>.

**Cummings, JW**, SJ Converse, CT Moore, DR Smith, CT Nichols, NL Allan, CM O’Meilia. 2017. A projection of lesser prairie-chicken (*Tympanuchus pallidicinctus*) populations range-wide. U.S. Geological Survey Open-File Report 2017-1071, <https://doi.org/10.3133/ofr20171071>.

Thorne, K, B Mattsson, J Takekawa, **JW** **Cummings,** D Crouse, G Block, V Bloom, M Gerhart, S Goldbeck, B Huning, C Sloop, M Stewart, K Taylor, L Valoppi. 2015. Collaborative Decision-Making Framework to Optimize Resilience of Tidal Marshes in Light of Climate Change Uncertainty. Ecology and Society 20(1):30 <http://dx.doi.org/10.5751/ES-07018-200130>

**Cummings, JW.** 2014. Decision Support for Wildlife Management. University of Vermont PhD Dissertation. <http://scholarworks.uvm.edu/graddis/290>

**Cummings, JW.** MJ Hague, DA Patterson, and RM Peterman. 2011. The impact of different performance measures on model selection for Fraser River Sockeye Salmon. North American Journal of Fisheries Management 31:323 — 334. <https://doi.org/10.1080/02755947.2011.562750>

**Cummings, JW.** 2009. The Impact of Management Objectives and Performance Measures on Model Selection for Fraser River Sockeye Salmon. Simon Fraser University. Thesis. ([link](http://rem-main.rem.sfu.ca/theses/CummingsJohnathan_2009_MRM477.pdf))

**In Progress**

**Cummings, JW,** A Hart, G Fay. No Replication Without Process Documentation: Assessing Management Strategy Evaluations. In revision for submission to Fisheries Research

**Cummings, JW**. No Replication Without Process Documentation: Assessing Management Strategy Evaluations. Will resubmitted to ICES Journal of Marine Science pending acceptance of above

**Cummings, JW,** SJ Converse, CT Moore, DR Smith, CT Nichols, NL Allan, CM O’Meilia. Integrating data sources for species status assessment: application to the lesser prairie-chicken.

**PRESENTATIONS**

INVITED Lectures and Agency Briefings

**Species Status Assessment Framework Implementation Team webinar.** Analyzing implicit decision framing, an unrecognized source of confusion in endangered species classification decisions. April 2018.

**Department of Fisheries Oceanography / SMAST seminar.** New Bedford, MA. Population Modeling and Decision Analysis for Resource Management. February 2018.

**Regional Directors Briefing.** Albuquerque, NM. Lesser Prairie-Chicken Draft Species Status Assessment. May 2017.

**Lesser Prairie-Chicken Species Status Assessment Contributor’s Working Group Workshop.** Denver, CO. Lesser Priarie-Chicken Literature Based Population Viability Analysis Model Review and Feedback. February 2017.

**USGS Leetown Science Center Seminar Series.** Kearnesville, WV. Decision Analysis, Model Selection, and Wildlife Management. February 2015

**Vermont Cooperative Fish and Wildlife Unit Cooperators Meeting**, Kehoe Conservation Camp, Castleton, VT. Decision Support for Wildlife Management. December 2011.

**University of Vermont WFB 161 Fisheries Biology & Management,** Burlington, VT. Pacific Salmon and Fraser River Sockeye Management, November 2011

**Fraser River Panel Technical Committee Post Season meeting**, Vancouver, BC. Model selection for management: An evaluation of Fraser River sockeye salmon management adjustment models. January 2009.

**Pacific Biological Station**, Nanaimo, BC. Effects of water temperature and flow on management adjustments for Fraser River sockeye salmon. September 2008.

**Pacific Salmon Commission**, Vancouver, BC.  Initial results of a retrospective evaluation of Fraser River sockeye salmon management adjustment models. December 2007.

**School for International Training Independent Study Project Fair**, Cairns, Australia. Bugger, Development of a Reforested Rainforest Invertebrate Community at Lake Barrine National Park. May 2005.

CONTRIBUTED Lectures

**American Fisheries Society**, Reno, NV. No Replication without Process Documentation: Assessing Management Strategy Evaluations. October 2019.

**The Wildlife Society**, Reno, NV. Structured Decision Making Provides Insight When Selecting a Preferred Population Monitoring Program. September 2019.

**The Wildlife Society**, Albuquerque, NM. Five Frameworks That Address the Controversy in Endangered Species Classification (poster). September 2019.

**ICES Annual Science Conference**, Gothenburg, Sweden. [Use of management strategy evaluation to inform fisheries management in a changing climate](https://www.ices.dk/_layouts/15/ASCProgram/downloadpdf/downloadpdf.ashx?generatepdf=https://www.ices.dk/sites/pub/ASC2019/Abstracts/Cummings%20abstract%20MSE%20review%20ICES.docx). September 2019.

**The Wildlife Society Conference**, Albuquerque, NM. We Have Been Talking Past Each Other: an Analysis of Decision Framings for Endangered Species Classification. September, 2017.

**Northeast Fish & Wildlife Conference**, Portland, ME. Assessing the value of maps in natural resource management: using Expected Value of Sample Information. April, 2014.

**American Fisheries Society**, Ottawa, ON. Evaluation of management-adjustment models for Fraser River sockeye salmon fisheries in British Columbia. August 2008.

**Fisheries and Marine Ecosystems**, hosted by University of Washington, Port Angeles, WA. Does the model fit the management? A retrospective evaluation of sockeye salmon management adjustment models for the Fraser River. April 2008.

**Fisheries and Marine Ecosystems**, hosted by Simon Fraser University, Gibsons, BC. Fraser River Sockeye: A Framework for Management Model Evaluation. April 2007.

**University of Vermont Summer Intern Fair**, Burlington, VT. Improving Tolerance-Based Biotic Indices In Agricultural Watersheds: Assessing Macroinvertebrate Responses To Agricultural Pollutants. August, 2004.

**ADDITIONAL WRITTEN WORK**

**Canada Lynx Expert Elicitation Workshop Report.** Zelenak, J, J Cummings, M Parkin, H Bell. Canada Lynx Expert Elicitation Workshop Report, October 13-15, 2015. Bloomington, Minnesota, USA

**Structured Decision Making Workshop Report**. Lamothe, P, C McGowan, J Cummings, S Jacobi, J Sweka , J Kocik, J Zydlewski, M Bartron, M Millard, D McCaw, O Cox, D Kircheis, L Zicari, D Shaw. Atlantic salmon conservation hatchery management within the Gulf of Maine Distinct Population Segment. A Case Study from the Structured Decision Making Workshop, June 17-21, 2013. National Conservation Training Center, Shepherdstown, West Virginia, USA

**Structured Decision Making Workshop Report**. Holman, H, M Post van der Burg, JW Cummings, S Fuller, P Keely, A Keer, H Kilpatrick, P Novak, P Stokes. How to Manage Eastern Cottontail Competition to Recover the New England Cottontail in the Northeast. A Case Study from the Structured Decision Making Workshop, February 6-10, 2012. National Conservation Training Center, Shepherdstown, West Virginia, USA

**Structured Decision Making Workshop Report.** Takekawa, J, K Thorne, B Mattsson, J Cummings, G Block, V Bloom, M Gerhart, S Goldbeck, J O’Halloran, B Huning, N Peterson, C Sloop, M Stewart, L Valoppi, D Crouse, S Converse, and M Haynes. Climate change and tidal marsh restoration in San Francisco Bay: should we restore more marshes to full tidal action and how should they be prioritized? A Case Study from the Structured Decision Making Workshop, October 17-21, 2011 Sacramento State University, Sacramento, California USA

**Structured Decision Making Workshop Report**. T Doyle, JW Cummings, M Eaton, S Johnson, S Johnston, S Lewis, J McConnell, J Neal, C Simonton, K Slagle, and KA Wagner. Structured Decision Process for Revising the US Fish and Wildlife Service Policy on Double-crested Cormorant Management. A Case Study from the Structured Decision Making Workshop, January 24-28, 2011. National Conservation Training Center, Shepherdstown, West Virginia, USA

**Interim Report.** Cummings, J.W. Retrospective Evaluation of Management Adjustment Models for Fraser River Sockeye Salmon. *In* Improvements to Environmental Management Adjustment Models: SEF Final Report. May, 2008.

**GRANTS RECEIVED**

NOAA Climate Program Office. Stakeholder Engagement in Management Strategy Evaluation of New England Groundfish In A Changing Ocean. $218,000. Sep 2019 - Aug 2021. co-PI.

**POSITIONS HELD**

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| **Independent Consultant**, Mid-Atlantic Fisheries Management Council | Aug. 2020 - Present  |
| Facilitation the Mid-Atlantic summer flounder management strategy evaluation stakeholder workshops to assist management of the recreational fishery. |
| **Post-Doctoral Fellow**, School of Marine Science and Technology, University of Massachusetts - Dartmouth, New Bedford, MA | 2018 – Present |
| Conducting a Management strategy evaluation to supply decision support to the Gulf of Maine ground-fish management plan development team. |  |
| **Independent Consultant** | Spring, 2018  |
| Assisted Compass Resource Management with development of the caribou management plan for the Province of British Columbia. |
| **Research Ecologist**, Patuxent Wildlife Research Center, US Geological Survey, Laurel, MD | 2014 - 2017 |
| Decision science, structured decision making, and species status assessment under the ESA |
| **Adjunct Faculty**, Champlain College, Burlington, VT | 2013 |
| Responsible for design and instruction of ENV 450 Environmental Decision Making, an undergraduate course on environmental and structured decision making. |
| **Course Design Consultant,** Champlain College, Burlington, VT | 2012 |
| Design of capstone environmental decision making course – ENV 450 Environmental Decision Making – for senior level students in Champlain College’s Environmental Policy major |
| **Tutor,** Tutor.com | 2012 |
| Online tutoring for junior high, high school, and college students in math and statistics. |
| **Teaching Assistant,** Simon Fraser University, Burnaby, BC | 2009 |
| Computer lab instructor for Applied Population Ecology (REM-311) |
| **Field Assistant,** University of British Columbia, Vancouver, BC | 2008 |
| Gill netting Rainbow Trout and Northern Pike Minnow |
| **Program Leader,** Audubon Vermont, Huntington, VT | 2006 |
| Co-leader of high school level field science courses |
| **Field Assistant,** The Ohio State University, Columbus, OH | 2006 |
| Mist netting and radio tracking Swainson's Thrush |
| **Retail Sales,** Soccer Plus, Columbus, OH | 2006 |
| Sales positions at soccer exclusive store |
| **Field Manager,** Fund for Public Interest Research, Columbus, OH | 2005 |
| Crew manager for street canvass |
| **Nature & Hiking Counselor,** Smugglers’ Notch Resort, Jeffersonville, VT | 2005 |
| Nature counselor for up to 25 11-18 year olds per day |
| **Summer Research Intern,** University of Vermont, Burlington, VT | 2004 |
| Technician for stream macroinvertebrate study |
| **Counselor,** Smugglers Notch Resort, Jeffersonville, VT | 2003 |
| Day camp counselor 12-18 year olds |
| **Meadows, Wetlands and Forests Counselor,** Smugglers Notch Resort, Jeffersonville, VT | 2002 |
| Environmental educator for 3-12 year olds, responsible for programming |
| **Field Manager,** Fund for Public Interest Research, Burlington, VT | 2001 |
| Manager and canvasser in 4 person door canvassing crew |
| **Crew Member,** Vermont Youth Conservation Corps, Burlington, VT | 2000 |
| Member of 8 person watershed restoration crew |

**TEACHING, FACILITATION, & MENTORING EXPERIENCE**

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| **Mentor**, Simon Fraser University REM Alumni Mentorship Program | 2020, ‘18, ‘15, ‘14 |
| Mentor to 5 students. These one-on-one connections introduce students to the structure and environment of the professional world where mentors teach, guide, advise, listen, support, validate, and provide a role model for current graduate students. |
| **Coach**, La Crosse, WI | February 24-28, 2020 |
| Co-facilitating the Grassland Monitoring Team adaptive management workshop |
| **Coach**, Westborough, MA | February 3-7, 2020 |
| Co-facilitating the Brook Floater structured decision making workshop |
| **Instructor**, 2-day structured decision making course, New Bedford, MA | May 20-21 2019 |
| Instructor for a 2-day Introduction to Structured Decision Making course attended by graduate students, and state and federal biologists. |
| **Instructor**, School for Marine Science and Technology, New Bedford, MA | Spring, 2019 |
| QuantfishR workshop instructor, teaching the use of ggplot2 and the development of Shiny applications in the programming language R |
| **Instructor**, National Conservation Training Center, Shepherdstown, WV | August, 2016 |
| Instructor for international cadre of students in Introduction to Structured Decision Making. |
| **Coach**, San Francisco, CA | Apr-May 2014 |
| Guided one of the regional teams through the San Francisco Bay Climate Adaptation Decision Support product development process |
| **Adjunct Faculty**, Champlain College, Burlington, VT | Fall Semester, 2013 |
| Responsible for design and instruction of ENV 450 Environmental Decision Making, an undergraduate course on environmental and structured decision making. |
| **Co-Coach**, National Conservation Training Center, Shepherdstown, WV | June 17-21, 2013 |
| Co-facilitated the Gulf of Maine Atlantic Salmon Hatchery Management structured decision making workshop |
| **Instructor**, University of Vermont, Burlington, VT | Fall Semester, 2012 |
| Designed and taught NR 285 Structured Decision Making, an upper level undergraduate and graduate course on structured decision making |
| **Co-Coach**, National Conservation Training Center, Shepherdstown, WV | February 6-10, 2012 |
| Co-facilitated the New England Cottontail Adaptive Resource Management structured decision making workshop |
| **Apprentice SDM Coach**, Sacramento, CA | October 17-21, 2011 |
| Assisted facilitation of the National Conservation Training Center structured decision making workshop addressing sea-level rise and tidal marsh restoration in San Francisco Bay. |
| **Co-facilitator**, University of Vermont, Burlington, VT | Fall Semester, 2011 |
| Co-facilitator for discussion sections in the Race and Culture in Natural Resources (NR 6) course |
| **Apprentice Coach**, National Conservation Training Center, Shepherdstown, WV | January 24-28, 2011 |
| Assisted facilitation of the National Conservation Training Center structured decision making workshop addressing US Fish and Wildlife policy on Double-crested Cormorant management. |
| **Teaching Assistant,** US Fish and Wildlife Northeast Regional Office, Hadley, MA | Nov 4-5, 2009 |
| Assisted instruction of a two day structure decision making course for USFWS employees |
| **Teaching Assistant,** Simon Fraser University, Burnaby, BC | Jan-Apr, 2009 |
| Instructor for the computer laboratory component of Applied Population Ecology (REM-311) |
| **Program Leader,** Audubon Vermont, Huntington, VT | July-Aug. 2006 |
| Co-leader of intensive overnight high school level field science courses |
| **Tutor,** Oberlin College, Oberlin, OH  | Spring 2003, 2004 |
| Tutor for student in Biology 120, Genetics, Evolution and Ecology |
| **Tutor,** Tutor.com | 2012 |
| Online tutor for junior-high, high school, and college students in math and statistics. |

**COURSES & CLASSROOM EXPERIENCE**

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| **The Wildlife Society Conference 2019**Hierarchical Statistical Modeling with Nimble**RStudio::Conf**Intermediate Shiny, January 15-16, 2019**Patuxent Wildlife Research Center**Applied Hierarchical Modeling, Nov 9-13, 2015**North Carolina State University**ECG 590 Dynamic Environmental and Resource Economics, spring, 2015**National Conservation Training Center** Advanced Structured Decision Making Practicum, March 19-23, 2018Advanced Structured Decision Making Practicum, March 10-14, 2014Decision Analysis: Elicitation and Facilitation, March 3-7, 2014Adaptive Management, April 30-May 4, 2012Advanced Structured Decision Making Practicum, March 12-16, 2012Introduction to Structured Decision Making, May 24-28, 2010**Oberlin College** ENVS 101 Environment and SocietyMATH 114 Statistical Methods for Biological SciencesPHIL 225 Environmental EthicsENVS 208 Environmental PolicyENVS 231 Environmental EconomicsENVS 340 Environmental Systems ModelingBIO 206 Population EcologyENVS 316 Systems Ecology | **University of Massachusetts – Dartmouth**Advanced Population Modeling**DataCamp**Data Scientist track. 12/23 courses completed**Utah State University**Integrated Population Modeling, July 25-29, 2016**Conservation Leaders for Tomorrow**Northeast Student Workshop, September 22-25, 2011**Simon Fraser University** REM 601 Social Science in Natural Resource ManagementREM 609 Management for Living ResourcesREM 611 Population and Community EcologyREM 612 Simulation ModelingREM 613 Methods Fisheries AssessmentREM 614 Advanced Methods Fisheries AssessmentREM 621 Ecological EconomicsREM 625 Risk/Decision AnalysisREM 644 Public Policy AnalysisREM 651 Project Evaluation/Valuation MethodsREM 698 Field Resource ManagementREM 801 Research Methods**University of Vermont** NR 285 Database Design for Environmental DataNR 343 Fundamentals of Geographic Information SystemsSTAT 223 Applied Multivariate AnalysisSTAT 330 Bayesian StatisticsWFB 352 Population Dynamics & Modeling |

**SKILLS AND SOFTWARE PROFICIENCY (Using Dreyfus Model)**

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| --- | --- | --- | --- |
| R – data visualization | Expert | RStudio | Expert |
| R – simulation modeling | Expert | R – tidyverse | Expert |
| R – statistical analysis | Proficient | R – markdown | Expert |
| Decision Support – Facilitation | Expert | R – shiny applications | Expert |
| Expert Elicitation | Expert | SQL (MySQL, Php, MySQL workbench) | Proficient |
| Objective Elicitation and Weighting | Expert | MS Office Suite (including Access) | Expert |
| Multiple Criteria Decision Analysis | Expert | VBA | Competent |
| Adaptive Management | Proficient | GitHub | Competent |
| Risk Analysis | Expert | Slack | Proficient |
| Value of Information | Proficient | Database design | Competent |
| Portfolio Analysis | Proficient | Web Design | Advanced Beginner |
| Dynamic Optimization | Competent | Python | Novice |
| Bayesian Analysis | Proficient | MATLAB | Novice |
| Hierarchical Modeling | Proficient | Communication |
| Integrated Population Modeling | Advanced Beginner | Reports – internal and external | Expert |
| Policy Analysis | Advanced Beginner |
| Ecological Economics | Competent | Journal publication | Proficient |

**VOLUNTER EXPERIENCE**

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| **Mentor,** Simon Fraser University REM Alumni Mentorship Program | 2014, ’15, ‘18, ‘20  |
| **Worship Associate,** South Church UU congregation, Portsmouth NH | June 2018 – June, 2022 |
| **Coming of Age Mentor,** South Church UU congregation, Portsmouth NH | Aug 2016 – June, 2017 |
| **Winter Term Internship,** Conservation Law Foundation, Montpelier VT | Jan-Feb, 2003 |
| **Winter Term Internship,** VT Public Interest Research Group, Montpelier, VT | Jan-Feb, 2002 |

**ACADEMIC SERVICE**

**Peer Reviews:** Journal of Fish and Wildlife Management, Global Ecology and Conservation, PLOS ONE

**Journal Review Coordinator,** Fisheries Science Research Group, Simon Fraser University 2007 - 2008

**Planner,** Fisheries and Marine Ecosystems Conference, 2007

**Member**, Climate Justice. Advocated for a climate neutral Oberlin College campus. 2003 - 2004

**Intern,** Oberlin Design Initiative, member of project team to institute industrial recycling. 2002 - 2003

**Founder/Coordinator,** EARTHWatch VT, County wide high school environmental group. 1999 - 2001

**Youth Planner,** VT Youth Environmental Summit. State high school summit. 1999 - 2001

**AWARDS**

**Special Thanks for Achieving Results (STAR) award,** Department of Interioraward for producing exceptionally high quality work under tight deadlines. Awarded in 2017 for work on the lesser prairie-chicken population viability analysis.

**Expert Certification - Structured Decision Making,** National Conservation Training Center, 2016

**DAR Good Citizen,** Daughters of the American Revolution Citizenship award: nominated by teachers and elected by peers, 400 graduates from the Essex, VT high school class of 2001.

**AFFILIATIONS**

**American Fisheries Society \* The Wildlife Society \* Society for Conservation Biology \* The Society of Decision Professionals \* Society for Judgement and Decision Analysis**

**REFERENCES**

|  |  |  |
| --- | --- | --- |
| Gavin Fay, PhD | School for Marine Science and Technology, UMASS | gfay@umassd.edu |
| Associate Professor | (508) 910-6363 |
| Sarah Converse, PhD | USGS, WA Cooperative Fish & Wildlife Research Unit | sconverse@usgs.gov |
| Professor, Unit Leader | (206) 221-5791 |
| David Smith, PhD | USGS, Leetown Science Center | drsmith@usgs.gov |
| Research Statistician (Biology) | (304) 724-4467 |
| Nathan Allan | USFWS, Region 2, RO-Ecological Services | nathan\_allan@fws.gov |
| Fish and Wildlife Biologist | (512) 490-0057, ext. 237 |
| Terri Donovan, PhD | USGS,VT Coop. Fish & Wildlife Unit | tdonovan@uvm.edu |
| Professor, Assistant Unit Leader | (802) 656-2516 |
| Randall Peterman, PhD | Simon Fraser University | peterman@sfu.ca |
| Professor Emeritus, C.R.C. in Fisheries Risk Assessment and Management | (778) 782-4683 |