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Engineering & Scientific Consulting

Katie Palmquist, Ph.D.

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Professional Profile

Dr. Palmquist has a strong interdisciplinary background in environmental toxicology, biology, and ecology. She has expertise in ecological risk assessment and natural resource damage assessment (NRDA) at large complex sites in multiple states and is experienced in assessing the risks of various chemicals (e.g., PAHs, metals, hydrophobic insecticides, and PCBs) to plants, birds, fish, and invertebrates.

As part of this work, Dr. Palmquist has used innovative approaches to define baseline conditions and quantify reductions in ecological services while also assessing the relative importance of other stressors as causal factors. Dr. Palmquist has significant work experience with power company clients, including assessment of potential injury to ecological resources and threatened and endangered species following wildland fires. She has also published on the effects of wildfires on stream ecosystems and watershed functions. In addition, Dr. Palmquist has also conducted ecological assessments of proposed submarine power cables at a number of offshore wind farm sites, with particular focus on possible effects of EMF exposure to resident fish and large invertebrate species in complex marine habitats.

Dr. Palmquist also has work experience in the field of pesticide toxicity and risk to non-target organisms. She has conducted pesticide registration work in both the United States and in the European Union and has authored several papers on the susceptibility of non-target invertebrates to insecticides. In addition, Dr. Palmquist has been retained on cases involving the contamination of food and other consumer products by various pest species. As part of this work, she has conducted inspections of products, reviewed the efficacy of pest control procedures, and constructed infestation timelines.

Academic Credentials & Professional Honors

Ph.D., Toxicology, Oregon State University, 2007

B.S., Entomology, Washington State University, 2003

B.A., Communications, Washington State University, 2003

Society of Environmental and Molecular Toxicology (current member)

Licenses and Certifications

40-Hour Hazardous Waste Operation and Emergency Response Certification (HAZWOPER)

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Professional Affiliations

Society of Environmental and Molecular Toxicology (current member)

CIGRE (International Council on Large Electric Systems) (past member

Publications

KR Palmquist is also published under KR Johnson.

Palmquist KR, Ma J, Kierski M, Morrison AM. Proactive Assessment of Relative Ecological Risk in Wildfire Prone Areas. EPRI Environmental Aspects of Transmission and Distribution: 2019 International Workshop Summary. December 2019. 72 pp.

Snyder DB, Bailey WH, Palmquist K, Cotts BRT, Olsen KR. Evaluation of Potential EMF Effects on Fish Species of Commercial or Recreational Fishing Importance in Southern New England. U.S. Dept. of the Interior, Bureau of Ocean Energy Management, Headquarters, Sterling, VA. OCS Study BOEM 2019-049, August 2019.

Palagyi T, Rice AN, Palmquist K. Use of passive acoustic monitoring to track marine mammals at offshore windfarm sites. Technical paper. CIGRE Symposium, Aalborg Denmark. June 4–7, 2019.

Palmquist KR, Sparacio T. Integrating industry surface water mitigation into preexisting, large-scale mitigation efforts. World Environmental and Water Resources Congress 2019: Watershed Management, Irrigation and Drainage, and Water Resources Planning and Management. pp. 258–263.

Palmquist KR, Deardorff TL. The effects of wildfire on stream ecosystems in the western United States: magnitude, persistence and factors affecting recovery. World Environmental and Water Resources Congress; pp. 389–396. 2016.

Deardorff TL, Palmquist KR, Shaller PJ, Shrestha PL. Western Wildfires and the Mississippi Delta: Lessons Learned About Ecosystem Management from Attempts to Control Mother Nature. World Environmental and Water Resources Congress; pp. 372–378. 2016.

Gard N, Palmquist KR. Wildfire Litigation in the Western United States: Technical Challenges in Assessment of Natural Resource Damages. ABA Section of Environment, Energy, and Resources. Superfund and Natural Resource Damages Litigation Newsletter. Vol. 11. No. 2. 2016.

Palmquist K, Fairbrother A, Salatas J. Pyrethroid insecticides: Use, environmental fate, and ecotoxicology. INTECH Open Access Publisher, 2012.

Palmquist KR, Fairbrother A, Salatas J, Guiney PD. Environmental fate of pyrethroids in urban and suburban stream sediments and the appropriateness of Hyalella azteca model in determining ecological risk. Integrated Environmental Assessment and Management 2011; 7(3):325-335.

Palmquist KR, Jenkins JJ, Jepson PC. Effects of dietary esfenvalerate exposure on three aquatic insect species representing different functional feeding groups. Environmental Toxicology and Chemistry 2008; 27(8):8-14.

Palmquist KR, Jenkins JJ, Jepson PC. Impact of aquatic insect life stage and emergence strategy on sensitivity to esfenvalerate exposure. Environmental Toxicology and Chemistry 2008; 27(8):1-7.

Palmquist KR, Jenkins JJ, Jepson PC. Clutch morphology and timing of exposure impact the susceptibility of aquatic insect eggs to esfenvalerate. Environmental Toxicology and Chemistry 2008; 27(8):52-59.

Johnson KR, Jepson PC, and Jenkins JJ. Esfenvalerate-induced case-abandonment adversely impacts *Brachycentrus americanus* behavior and survival. Environmental Toxicology and Chemistry 2008; 27(2):397-403.

Johnson JD, Johnson KR. Hybrid poplar genotype affects attack incidence by the Poplar-and-Willow Borer (*Cyptorhynchus lapathi*). Western Journal of Applied Forestry 2003; 18:276-280.

Reports

U.S. EPA. Integrated Science Assessment (ISA) For Lead (Final Report, Jul 2013). U.S. Environmental Protection Agency, Washington, DC, EPA/600/R-10/075F, 2013.

Duncan J, Hinchcliffe A, Palmquist K. Lot 5: Evidence of potential long term effects in (aquatic and terrestrial) invertebrates after short term pulsed exposure. Exponent report prepared for European Food Safety Authority, August 2009.

Brown K, Tomlinson J, Duncan J, Hinchcliffe A, Palmquist K. Lot 4: Critical comparison of available and potential higher tier testing approaches for the risk assessment of plant protection products, considering at least field and semi-field experimental designs, extrapolation from dose-response relationships, and increased dosages (aquatic and terrestrial). Exponent report prepared for European Food Safety Authority, August 2009.

Presentations

Palmquist KR. The Science of NRDAs in Wildfire Litigation. LSI: 12th Annual Santa Fe Advanced Conference on Litigating Natural Resource Damage. July 19, 2019.

Palmquist KR. Climate Change, Wildfire and Ecological Impacts: A California Case Study. LSI: 13th Annual Santa Fe Advanced Conference on Litigating Natural Resource Damages. August 20, 2020.

Palmquist KR. Wildfire and the Endangered Species Act. Fires in the Pacific Northwest. The Seminar Group. April 27, 2021.

Palmquist K, Sparacio T, Goodfellow W. Habitat remediation strategies for mitigating salinity inputs to freshwater system, at the Society of Environmental Toxicology and Chemistry (SETAC) 40th Annual Meeting, Toronto, Canada. November 3-7, 2019.

Palagyi T, Rice AN, Palmquist K. Use of passive acoustic monitoring to track marine mammals at offshore windfarm sites. Eco-design and environmental concerns, the environmental aspects (planet). CIGRE Symposium, Aalborg Denmark. June 7, 2019.

Palmquist KR, Sparacio T. Integrating industry surface water mitigation into preexisting, large-scale mitigation efforts. World Environmental & Water Resources Congress. Pittsburgh, PA. May 20, 2019.

Palmquist KR, Ma J, Kierski M, Morrison AM. Proactive Assessment of Relative Ecological Risk in Wildfire Prone Areas. EPRI Environmental Aspects of Transmission and Distribution International Workshop. London, England. March 12-13, 2019.

Palmquist KR. Big Data or Bad Data? Potential Concerns with Using Publicly Available Monitoring Data to Define Ecological Baseline Before a Fire, at the Wildland Fire Litigation 12th Annual Conference, Coronado, CA, April 27-29, 2018.

Palmquist KR, Morrison AM, Edwards M. Addressing White Hat Bias - Lessons from Environmental Litigation, at the SETAC 38th Annual Meeting, Minneapolis, MN, November 12-16, 2017.

Palmquist KR. Overcoming the Pitfalls of Published Science Practical Strategies for Litigation, at the

Wildland Fire Litigation 11th Annual Conference, Coronado, CA, April 21-23, 2017.

Palmquist KR, Ginn TC, Boehm PD, Morrison AM. Addressing spatial data gaps in deep-sea benthic sediment sampling following a large-scale oil spill. Ninth International Conference on Remediation and Management of Contaminated Sediments January 9, 2019.

Palmquist K, Deardorff TL. 2016. The Effects of Wildfire on Stream Ecosystems in the Western United States: Magnitude, Persistence and Factors Affecting Recovery. World Environmental and Water Resources Congress. Palm Beach, FL.

Deardorff TL, Palmquist K, Shaller PJ, Shrestha PL. 2016. Western Wildfires and the Mississippi Delta: Lessons Learned About Ecosystem Management from Attempts to Control Mother Nature. World Environmental and Water Resources Congress. Palm Beach, FL.

Kashuba R, Menzie C, Cerreto K, Palmquist K, Kessel C. Challenges in deriving causal relationships from field observational data: A case study in West Virginia headwaters. Presented at the Session: Bayesian Networks and Other Probabilistic Methods Applied to Ecological Risk, at the Society for Risk Analysis (SRA) 2014 Annual Meeting, Denver, CO, December 10, 2014.

Kashuba R, Cerreto K, Palmquist K, Kessel C, Menzie C. Cautions for deriving causal relationships and water quality benchmarks from field observational data: A case study in West Virginia headwaters. Presented at the Session: Assessing Contaminant Effects in Multi-stress Ecosystems, at the Society of Environmental Toxicology and Chemistry (SETAC) North America 35th Annual Meeting, Vancouver, BC, Canada, November 9-13, 2014.

North America 31st Annual Meeting, Portland, OR, November 7-11, 2010.

Palmquist K, Fairbrother A, Salatas J, Guiney P. Environmental fate of pyrethroids in urban stream sediments and the appropriateness of Hyalella azteca model in determining ecological risk. Presented at the Session: Pyrethroids in the environment - Part 3, at the Society of Environmental Toxicology and Chemistry (SETAC) North America 31st Annual Meeting, Portland, OR, November 7-11, 2010.

Palmquist KR, Jenkins JJ, Jepson PC. Impact of aquatic insect life stage and emergence strategy on sensitivity to esfenvalerate exposure. Presented at the Pacific Branch Society of Environmental Chemistry and Toxicology Meeting and at the North American Benthological Society Meeting, 2008.

Johnson KR, Jenkins JJ, Jepson PC. Clutch morphology and the timing of exposure impact the susceptibility of aquatic insect eggs to esfenvalerate. Presented at the Society of Environmental Chemistry and Toxicology 28th Annual Meeting, 2007.

Johnson KR, Jenkins JJ, Jepson PC. Use of multiple life stages in assessing Cinygmula sp. mayfly nymph sensitivity to esfenvalerate. Presented at the Pacific Northwest Branch Society of Environmental Chemistry and Toxicology Meeting, Port Townsend, WA, and presented at the Pacific Branch Entomological Society of America 91st Annual Meeting, Portland, OR, 2007.

Johnson KR. Pesticide sub-lethal effects in non-target aquatic organisms. Presented at Washington State University Pesticide Re-certification short courses, Lacey & Vancouver, WA, 2007.

Johnson KR, Jenkins JJ, Jepson PC. Esfenvalerate and chlorpyrifos differentially affect native Pacific Northwest aquatic insects. Presented at the American Chemical Society 232nd Annual Meeting, San Francisco, CA, 2006.

Johnson KR, Jenkins JJ, Jepson PC. Life stage influences Pacific Northwest aquatic insect susceptibility to esfenvalerate. Presented at the North American Benthological Society 54th Annual Meeting, Anchorage, AK, 2006.

Johnson KR, Jenkins JJ, Jepson PC. Esfenvalerate induces case-leaving in the Pacific Northwest caddisfly Brachycentrus americanus. Presented at the Society of Environmental Toxicology and Chemistry 26th Annual Meeting, Baltimore, MD, 2005.

Johnson KR, Jenkins JJ, P.C. Jepson. Esfenvalerate and chlorpyrifos differentially affect native Pacific Northwest aquatic insects. Presented at the American Chemical Society 232nd Annual Meeting, San Francisco, CA, 2006.

Johnson KR, Jenkins JJ, Jepson PC. Life stage influences Pacific Northwest aquatic insect susceptibility to esfenvalerate. Presented at the North American Benthological Society 54th Annual Meeting, Anchorage, AK, 2006.

Johnson KR, Jenkins JJ, Jepson PC. Esfenvalerate induces case-leaving in the Pacific Northwest caddisfly Brachycentrus americanus. Presented at the Society of Environmental Toxicology and Chemistry 26th Annual Meeting, Baltimore, MD, 2005.

Project Experience

Extensive experience in Natural Resource Damage Assessment (NRDA) conducted in both terrestrial and aquatic environments, focusing on injury to plants, birds, invertebrates, and both demersal and pelagic fish, following a large-scale oil spill. This involved multiple complex sites and habitats, potentially impacted by a number of interacting stressors.

Conducted NRDAs and ecological risk assessments for legacy mining sites in the western United States, including evaluation of potential effects on fish, aquatic invertebrates, birds and plants. As a part of the processes, compensatory restoration plans were reviewed and evaluated for appropriateness.

Assessed possible impacts to ecological resources following a high-severity wildfire, including loss of mature forest and impacts to critical habitats for resident endangered species.

Evaluated multiple sites and properties for potential impacts to environmental and ecological resources following a large wildfire in California.

Developed a series of mitigation project options to offset salinity inputs to a freshwater system, incorporating multiple stakeholder concerns while assessing ancillary ecological benefits of developed projects.

Assessed impacts to marine benthic invertebrate communities from both physical and chemical stressors at shipyard sites in San Diego, California, utilizing a number of benthic community indices.

Reviewed possible ecological impacts of operating submarine AC cables on coastal and marine species in support of the permitting and review process for a number of proposed offshore wind facilities off the US Atlantic coast. Assessment included potential behavioral and population-level impacts to benthic resources, resident finfish species, sharks and rays, and marine mammals and sea turtles, as well as threatened or endangered species.

Conducted aquatic impact assessment for operations of a proposed DC submarine transmission cable in Lake Champlain. Assessment utilized site-specific magnetic field calculations and focused on a number of species of interest, including fish of special concern to the states of Vermont and New York, and considered potential impacts of cable operation on species' behavior and life history, including key anadromous species.

Assessed potential operating impacts of a DC transmission line with a proposed route through Lake Erie, with particular attention to the potential effects on endangered and anadromous fish species. Effects on

physiological homeostasis, behavior, development, and migration were addressed and assessed for each species.

Inspection of food product alleged to be infested with various stored product pest insects, followed by review of warehouse pest control procedures and development of infestation timelines based on plaintiffs' claims. The use of statistically and scientifically defensible assessment methods for guiding sampling and analysis methods.

Conducted an inspection of a consumer product for a confidential client to determine the source of customer-observed infestation. Correct species identification allowed client to pinpoint supply-chain issues.

Evaluated available invertebrate community data associated with a NRDA site in the Midwest United States, and provided an independent re-analysis of the data. This evaluation incorporated a number of variables, including physio-chemical characteristics, microhabitat characteristics, and watershed-scale data.

Contributed to a NRDA evaluation located at an East Coast refinery site. This included reviewing benthic invertebrate and fish community data for comparison to historical biological data collected at multiple time points at the same site to assess long-term population trends.

Designed a preliminary ecological risk assessment plan for a landfill site in Washington State. Evaluated and selected appropriate ecological receptors and determined proximity of the site in relation to threatened/endangered species habitats.

Prepared sampling and analysis plans as part of a multi-phase site investigation for two remote sites with former mining and smelting activities. Key sampling efforts addressed soil, sediment, and surface water chemistry data, as well as freshwater macroinvertebrate diversity and abundance.

Oversaw and managed the field sampling associated with a complex lead-contaminated site in California. This required coordination and cooperation with outside consultants, management of large amounts of data (200+ samples per day), and onsite lead analysis via x-ray fluorescence. Performed onsite evaluation of day-to-day conditions and adapted sampling program accordingly.