## PAUL R. ADAMUS

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### Summary

Known nationally for expertise in wetland assessment, Dr. Adamus has taught wetland assessment to dozens of consultants, local planners, college students, and agency staff in 3 continents and many states. He has authored or co-authored nearly 100 publications, including an encyclopedia section on wetlands. He began his career at The Smithsonian's Center for Natural Areas, 1977-1982. There, he did pioneering work in wetlands function assessment, authoring a method (WET) used widely by federal agencies in the decade that followed. He also published one of the first scientific journal articles to propose criteria for using species as a basis to identify critical natural areas. He was invited twice to testify on wetland assessment to the U.S. Congress. In 1985 the City-Borough of Juneau, Alaska, awarded Dr. Adamus a sole-source contract to assess all their wetlands and explain wetland functions to citizens in a series of community meetings. In 1987 he accepted a research position at the US EPA's National Wetlands Research Program in Corvallis, Oregon. He left 10 years later, taking a research faculty position at Oregon State University and simultaneously reestablishing his practice as a scientific consultant to non-profit groups and government agencies. For the Bureau of Land Management, he developed statistical designs for detecting trends in wetland condition on BLM lands throughout the US. From 1997-2000, the Oregon Division of State Lands contracted him to develop an assessment method for western Oregon, as well as a classification for all Oregon wetlands. By law, permit applicants are now required to use key parts of that method, which is founded on botanical and hydrogeomorphic data Dr. Adamus and volunteers collected from 109 reference wetlands. He recently conducted a similar data collection from 120 tidal wetlands, resulting in an assessment method and guidebook for tidal wetlands of the Oregon Coast.

A lifelong birder, Dr. Adamus coordinated the Oregon Breeding Bird Atlas Project from 1995 to 1999. Published in 2001, the Atlas resulted from the largest statewide survey of wildlife ever conducted in Oregon, and necessitated recruiting and coordinating over 800 volunteers. He also contributed to the Alternative Futures Analysis for the Willamette Valley (sponsored by the interagency Environmental Research Consortium, ERC), developing and documenting spatially-explicit models for each of western Oregon's 279 vertebrate species, and using the models with GIS to simulate changes in fine-scale species distributions in the region under various scenarios of future land cover change. Currently, he is serving on a federal panel of scientists commissioned by the National Park Service to review rapid ecological assessment methods nationwide, as well as a panel . reviewing recommendations for modifying water quality criteria to better address conditions unique to the Arid West, and a committee charged with guiding the development of a statewide method for assessing Oregon's wetlands.

## **Education**

- Ph.D. Wildlife Science, Oregon State University, Corvallis
- M.S. Biology (Aquatic), University of Utah, Salt Lake City
- B.S. Wildlife Science, University of Maine, Orono

# Accomplishments

#### Oregon State University, Corvallis, Oregon

College of Oceanographic and Atmospheric Sciences, Courtesy Faculty, 2002-present Department of Fisheries & Wildlife, Faculty Research Assistant, 1997-2001

- Teach 1-2 short-courses per year on assessing wetland systems (through Portland State University).
- Under a National Park Service agreement, am designing, directing, and helping conduct a survey of wetlands and their ecological condition in two National Parks in the western United States.
- Under an EPA grant, I provided assistance at a national scale to state wetland programs, including guidance on sampling wetlands and developing criteria to protect wetland biological communities
- Wrote report for EPA on biological assessment of wetlands, based on review of >1500 articles from the scientific literature. Much of this was subsequently adopted by Washington Dept. of Ecology in their "best available science" report to the Washington Legislature.
- Prepared 2 national databases cataloging the sensitivity of wetland plant and invertebrate species to excessive nutrients and hydrologic alteration of wetlands. Also prepared guidance for use of birds in monitoring of wetland ecological condition. These products are on EPA's web page.
- Under another EPA grant, I collaborated with other faculty and 2 local watershed councils (Long Tom and South Santiam) in a 3-year analysis of priorities for ecosystem restoration in part of the Willamette Valley.

#### Adamus Resource Assessment, Inc., Corvallis, Oregon (Principal), 1997-present

- Design, direct, and participate in field studies and report preparation almost exclusively for non-profit groups and government agencies (only minor private-sector work).
- Am serving as chief wildlife consultant on national panel tasked with reviewing and recommending rapid procedures for inventory and assessment of biodiversity in our National Parks.
- Directed and helped conduct a coastwide analysis of functions of tidal wetlands, using GIS and field data, in order to establish reference sites, performance standards, and monitoring procedures for restored tidelands. Project was funded by USEPA grant to Oregon Department of State Lands and Coos Watershed Association.
- Prepared a synthesis of data and information on Willamette Basin wildlife for the Willamette
  Restoration Initiative and Northwest Power Conservation Council's subbasin planning effort. This
  effort involved designing and overseeing the application of GIS models for all 280+ terrestrial
  vertebrate species, in order to identify species and habitat priorities for restoration and protective
  acquisition within each of the Basin's 170 watersheds.
- Prepared an analysis of wetland restoration and enhancement potentials of individual Metro properties throughout the greater Portland area, for Metro Parks and Greenspaces.
- Contributed to an assessment of wetland restoration and conservation potential in the Scappoose Bottomlands, and currently am doing a similar analysis for Youngs Bay on the Lower Columbia.

- Completed an assessment of the current status of Western Pond Turtle in the Willamette Valley, based on existing data, a targeted bulk mailing to landowners, and extensive surveys I conducted.
- Completed an assessment of significant natural features for the City of Corvallis and a watershed assessment for the Luckiamute Watershed Council.
- With funding from National Science Foundation, helped organize conference on Urban Wetlands, May 2002, Portland, Oregon.
- On contract to Oregon Department of State Lands, prepared the framework for classifying and
  assessing the function and condition of riparian and wetland areas throughout Oregon, using
  hydrogeomorphic (HGM) principles. Designed and conducted field data collection from a series of
  109 reference sites, analyzed data, and prepared 3-volume report to help establish standards for
  restoration projects in the Willamette Valley.
- Assisted the Confederated Tribes of the Umatilla Indian Reservation in design and collection of field data on biological and geomorphic characteristics of lower Umatilla River floodplain wetlands, based on 40 transects spanning the 80-mile length of the study area. Conducted an indepth statistical analysis of the data and prepared technical report.
- Designed, conducted, and analyzed field data from riparian and floodplain habitats of the lower McKenzie River, and prepared restoration recommendations for the McKenzie Watershed Council based on the collected data.
- Coordinated 800 volunteers across the state of Oregon in a 5-year data collection project, the Oregon Breeding Bird Atlas Project.
- Under contract to the USEPA Research Lab, Corvallis, I developed spatially-explicit habitat
  models for all 279 birds, mammals, amphibians, and reptiles that inhabit the Willamette Valley.
  EPA and partner agencies have used these for the "Alternatives Futures" growth analyses for the
  region.
- Serve as an appointed member of the technical oversight panel of EPA's Arid West Water Quality Research Program, providing scientific guidance and peer review of project documents.
- Assist private landowners in function and biological assessments of restored wetlands as part of regional wetland mitigation banks.

#### Dynamac International, Inc., Rockville, MD, Senior Ecologist, 1996-1998

- Designed a statistically-valid study to investigate possible impacts of acid mine drainage at a
  Superfund site near Redding, California, on behalf of plaintiffs (the USDI Bureau of Land
  Management and others) in litigation under the National Resource Damage Act (NRDA). I then
  directed and helped conduct an extensive survey of riparian plants, birds, and amphibians which
  established harm to the watershed's resources.
- Led effort to define a statistically valid strategy for resampling 4000 stream reaches and wetlands in the western United States. These sites had been sampled previously by the Bureau of Land Management and USDA Forest Service using their Proper Functioning Condition (PFC) protocol.

**USEPA Wetlands Research Program**, Environmental Research Laboratory, Western Ecology Division, Corvallis, Oregon. Project Scientist on contract to EPA for:

Dynamac International, Inc., 1996-1997

ManTech Environmental Research Services Corporation, 1989-1996

Northrop Services Incorporated, 1987-1989.

• Authored or co-authored major EPA reports: ecological indicators, impacts to wetlands, biodiversity, wetlands biomonitoring methods, cumulative impact assessment.

- Wrote book chapters: riparian classification, state wetland programs, wetland birds as indicators.
- Designed and conducted research: habitat requirements of riparian and wetland birds at multiple scales.
- Organized and chaired national symposia: wetlands water quality, wildlife indicators.
- Was called upon frequently by EPA regional offices and states for wetland technical assistance.

#### Adamus Resource Assessment, Inc., Augusta, Maine (Principal), 1985-1987

- Designed and directed comprehensive wetlands analysis project for City-Borough of Juneau,
  Alaska. Obtained support of regulatory agencies. Implemented community involvement program.
  Designed, supervised, and helped conduct field data collection (salmonids, stream & estuarine
  wetland habitat, birds, water quality, groundwater) to calibrate functional assessment models for
  regional use.
- Delineated jurisdictional wetlands and prepared mitigation plans. Assisted private clients with permit negotiations.
- Assisted the Wetlands Research Program of the US Army Corps of Engineers.
- Trained wetlands personnel from the USEPA and US Army Corps of Engineers.

## EcoAnalysts Inc., Bath, Maine, Senior Scientist, 1983-1985

Co-directed statewide monitoring of biological effects of forest pesticides.

## Maine Department of Energy, 1983

Published an analysis of strategies for development of tidal power in Maine estuaries.

Center for Natural Areas, Gardiner, Maine, Scientist, then Senior Scientist, 1976-1982

Prepared and published several dozen "best management practices" manuals, biological surveys, impact statements, and risk assessments for national nonprofit research institute affiliated with the Smithsonian Institution, under contract to government agencies.

**Oak Ridge National Laboratory**, Oak Ridge, Tennessee, research intern, summer 1971 Designed and conducted study of power plant impacts on zooplankton.

**Maine Department of Inland Fisheries & Wildlife**, intern, summers 1969 & 1970 Did field assessments for statewide wetlands inventory, led wildlife refuge tour groups.

## **Wetland Program Consultations**

State/Tribe Wetland Program Consultation:

North Carolina (Dept. Environmental Management)

Illinois (Dept. of Conservation)

Maine (State Planning Office)

Washington (Dept. of Ecology)

Oregon (Dept. Environmental Quality, Department of State Lands)

Oklahoma

Confederated Tribes of the Umatilla Indian Reservation

# Regional Wetland Functional Assessment Projects:

Klamath Region (Lassen & Crater Lakes National Parks)

Oregon Coast: HGM data collection, model development, and application

Willamette Valley, Oregon: HGM data collection, model development, and application

Juneau, Alaska: Wetland Management Plan

New Jersey (Hackensack Meadowlands): Wetlands Advanced Identification Project

Salt Lake City, Utah: Wetlands Advanced Identification Project Southern Maine: Wetlands Advanced Identification Project

Washington (Mill Creek Watershed): Special Area Management Plan

#### **Publications of Paul R. Adamus**

## 1. Wetland/Riparian Publications

Adamus, P.R. and others. in review. *Policy paper on rapid methods for assessment of wetlands*. Society of Wetland Scientists and Association of State Wetland Managers.

Adamus, P.R. 2005. A rapid assessment method for tidal wetlands of the Oregon Coast: Volume 1 of a Hydrogeomorphic Guidebook. Oregon Department of State Lands, USEPA, and Coos Watershed Association.

Adamus, P.R. 2005. Scientific review and data analysis results for tidal wetlands of the Oregon Coast: Volume 2 of a Hydrogeomorphic Guidebook. Oregon Department of State Lands, USEPA, and Coos Watershed Association.

Adamus, P.R., R. Scranton, and J. Larsen. 2005. Wetland profiles of Oregon's coastal watersheds and estuaries. Volume 3 of a Hydrogeomorphic Guidebook. Oregon Department of State Lands, USEPA, and Coos Watershed Association.

Adamus, P.R.. 2005. Software and database for selected tidal wetlands of the Oregon Coast. Oregon Department of State Lands, USEPA, and Coos Watershed Association.

Adamus, P.R. 2005. *An assessment of wetland restoration and enhancement potential on Metro properties*. 2005. Metro Parks and Greenspaces, Portland, OR.

Adamus, P.R. 2004. *Classification, Assessment, Monitoring, and Evaluation of Riverine and Palustrine Wetland Ecosystems*. Chapter 12 In: M. McKinstry (ed.). Wetland and Riparian Areas of the Intermountain West. University of Texas Press. <a href="http://www.utexas.edu/utpress/books/mckwet.html">http://www.utexas.edu/utpress/books/mckwet.html</a>

Adamus, P.R. 2002-present. *Annual monitoring reports for the Amazon Wetland Mitigation Bank*. Oregon Department of State Lands and Mitigation Bank Review Team (MBRT).

Lev, E., R. van der Schaaf, J. Christy, P. Adamus, and J. Alexander. 2004. *Scappoose Bay Bottomlands conservation and restoration plan*. Scappoose Bay Watershed Council, Lower Columbia River Estuary Partnership, USEPA.

Adamus, P.R., J. Webster, C. Shippentower, S. O'Daniel, D.E. Williams, and S. Minthorn. 2002. *Umatilla River Floodplain and Wetlands: A Quantitative Characterization, Classification, and Restoration Concept.* Confederated Tribes of the Umatilla Indian Reservation, Pendleton, OR. <a href="http://www.umatilla.nsn.us/database/wetlands">http://www.umatilla.nsn.us/database/wetlands</a>

Adamus, P.R., T.J. Danielson, and A. Gonyaw. 2001. *Indicators for Monitoring Biological Integrity of Inland Freshwater Wetlands: A Survey of North American Technical Literature (1990-2000)*. Office of Water, U.S. Environmental Protection Agency, Washington, DC. EPA843-R-01. <a href="http://www.epa.gov/owow/wetlands/bawwg/monindicators.pdf">http://www.epa.gov/owow/wetlands/bawwg/monindicators.pdf</a>

U.S. EPA. 2001. *Methods for Evaluating Wetland Condition: Biological Assessment Methods for Birds*. Office of Water, U.S. Environmental Protection Agency, Washington, DC. EPA-822-R-02-023. <a href="http://www.epa.gov/waterscience/criteria/wetlands/13Birds.pdf">http://www.epa.gov/waterscience/criteria/wetlands/13Birds.pdf</a>

Adamus, P.R. 2001. *Guidebook for Hydrogeomorphic (HGM)–based Assessment of Oregon Wetland and Riparian Sites. Statewide Classification and Profiles.* Oregon Department of State Lands, Salem, OR. <a href="http://statelands.dsl.state.or.us/hgm\_guidebook.htm">http://statelands.dsl.state.or.us/hgm\_guidebook.htm</a>

Adamus, P.R. and D. Field. 2001. *Guidebook for Hydrogeomorphic (HGM)–based Assessment of Oregon Wetland and Riparian Sites. I. Willamette Valley Ecoregion, Riverine Impounding and Slope/Flat Subclasses. Volume IA: Assessment Methods.* Oregon Department of State Lands, Salem, OR. <a href="http://statelands.dsl.state.or.us/hgm\_guidebook.htm">http://statelands.dsl.state.or.us/hgm\_guidebook.htm</a>

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Adamus, P.R. and A. Gonyaw. 2001. *National Database of Wetland Plant Sensitivities to Enrichment and Hydrologic Alteration*. Office of Water, U.S. Environmental Protection Agency, Washington, DC. <a href="http://www.epa.gov/owow/wetlands/bawwg/publicat.html">http://www.epa.gov/owow/wetlands/bawwg/publicat.html</a>

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Adamus, P.R. and L. Fish. 2000. *Biological Evaluation of the Willamette River and McKenzie River Confluence Area. II. Restoration of Wildlife and Riparian Habitat.* Report to the McKenzie Watershed Council, Springfield, OR.

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Rosen, B.H., P. Adamus, and H. Lal. 1995. *A conceptual model for the assessment of depressional wetlands in the Prairie Pothole Region*. Wetlands Ecology and Management 3(4): 195-208

Adamus, P.R. 1993. *User's manual: Avian richness evaluation method (AREM) for lowland wetlands of the Colorado Plateau*. EPA/600/R-93/240. U.S. Environmental Protection Agency, Environmental Research Laboratory, Corvallis, OR. <a href="http://www.epa.gov/owow/wetlands/wqual/arem\_man/">http://www.epa.gov/owow/wetlands/wqual/arem\_man/</a>

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Adamus, P.R. 1991. *Potential approaches for classification of wetland uses for protecting wetland quality.* Conditionally accepted for publication in Water Resources Bulletin.

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