

Brad Piehl

Hydrologist/Facilitator

Education

M.S. Forest Engineering, Hydrology/Water Quality, Oregon State University, 1986

B.S. Forest Resources, Forest Hydrology, University of Minnesota, 1984

Qualifications

Brad Piehl has 24 years of environmental consulting experience. Brad's specialty is in developing innovative approaches to landscape level assessments that result in prioritizing projects at the watershed and subwatershed level. He is considered a NEPA expert by several public agencies. He has also served as a facilitator and public involvement lead on many natural resource projects throughout the West.

He has managed projects at the regional, landscape, and project level, as well as, policy analysis for federal and state agencies and private clients. He works with clients to develop effective interdisciplinary approaches to problem solving for watershed and landscape-level issues typically dealing with natural resource issues.

Project Experience – Forest Hydrology

Colorado State Forest Service, Front Range Watershed Protection Data Refinement Work Group, Facilitation of Watershed Assessment Approach, CO - Served as work group facilitator and technical consultant for a the creation of a watershed assessment procedure. The procedure will prioritize watersheds within watersheds for wildfire risk reduction based upon their potential for adverse changes in hydrologic function following wildfire and their locations within zones of concern for water supplies. He also completed a watershed assessment for the Upper South Platte watershed as a test case for the Work Group. The work is described in the document titled Protecting Critical Watersheds in Colorado from Wildfire: A Technical Approach to Watershed Assessment and Prioritization.

Watershed/Wildfire Assessments -

Served as stakeholder facilitator and technical lead for many watershed assessments in Colorado and Wyoming using the procedure described in the document titled Protecting Critical Watersheds in Colorado from Wildfire: A Technical Approach to Watershed Assessment and Prioritization. These projects prioritized sixth-level watersheds within four-level watersheds for wildfire risk reduction based upon their potential for adverse changes in hydrologic

function following wildfire and their locations within zones of concern for water supplies.

Completed Watershed/Wildfire Assessments include:

Pikes Peak Watershed Assessment in Colorado

Upper Colorado Headwaters Watershed Assessment in Colorado

Blue River Watershed Assessment in Colorado

Upper South Platte Watershed Assessment in Colorado

Arkansas Headwaters Watershed Assessment in Colorado

Saint Vrain Watershed Assessment in Colorado

Watershed/Wildfire Assessments currently underway include:

South Platte Headwaters Watershed Assessment in Colorado

Bark Beetle Incident, Watershed/Wildfire Assessments - Currently serving as technical lead for 16 watershed assessments in Colorado and Wyoming using the procedure described in the document titled Protecting Critical Watersheds in Colorado from Wildfire: A Technical Approach to Watershed Assessment and Prioritization. These assessments will prioritize sixth-level watersheds within four-level watersheds for wildfire risk reduction based upon their potential for adverse changes in hydrologic function following wildfire and their locations within zones of concern for water supplies. These assessments will provide the technical pieces of the procedure for stakeholder groups to use in determining priorities in their watersheds.

USDA Forest Service, Black Hills National Forest, Northern Hills Ranger District, West Rim EIS, SD – Served as Hydrologist/Soils Scientist for the West Rim EIS. This project had a combined US Forest Service and JW Associates technical team. We completed the project in less than one year with excellent cooperative work between the agency and JW Associates. The purpose of the project is to reduce the wildfire risk and potential of Mountain pine beetle infestation primarily in the Ponderosa pine forests of the Northern Hills Ranger District of the Black Hills National Forest. Treatments include thinning, prescribed fire and wildland urban interface treatments.

Modoc National Forest (USFS), Alturas and Eagle Field Offices (BLM), and Modoc County, Sagebrush Steppe EIS, Northeast CA – Project Manager and

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hydrology/soils lead for a landscape-scale EIS covering 6.5 million acres. This project will establish direction for restoration of areas that have been invaded by juniper over the last 100+ years. Extensive public involvement and facilitation during project. Proposal required RMP amendment for Alturas FO. Management direction will include various treatments covering up to 50,000 acres per year for the next 20-30 years.

Western Mogollon Plateau Landscape Assessment, Northern Arizona University, Forest ERA Project, Flagstaff, AZ – Watershed technical lead for the 3-million acre Western Mogollon Plateau Landscape Assessment that included a large portion of the ponderosa pine zone in Arizona. Developed methodology for the watershed analysis that was part of the overall assessment. Methodology included ranking potential impacts of wildfire and forest management on soils, sediment transport and deposition, and peakflow/runoff. Completed streamlined GIS stream classification to support the sedimentation analysis.

White Mountains Landscape Assessment, Northern Arizona University, Forest ERA Project, Flagstaff, AZ – Watershed technical lead for the 2.1-million acre White Mountains Landscape Assessment including all the Apache-Sitgraves National Forest in eastern Arizona. Developed methodology for ranking watershed values and risks for the watershed analysis that was part of the overall assessment. Methodology included ranking potential impacts of wildfire and forest management on soils, sediment transport and deposition, and peakflow/runoff. Completed streamlined GIS stream classification to support the sedimentation analysis. Also served as workshop facilitator that completed prioritization of geographic areas and management options in 3 days.

Northern New Mexico Landscape Assessment, Northern Arizona University, Forest ERA Project, Flagstaff, AZ – Watershed technical lead for the 3-million acre Northern New Mexico Landscape Assessment that includes most of the forested land in northern New Mexico. Developed methodology for the watershed analysis that was part of the overall assessment. Methodology included ranking potential impacts of wildfire and forest management on soils, sediment transport and deposition, and peakflow/runoff. Completed streamlined GIS stream classification to support the sedimentation analysis.

USDA Forest Service, Black Hills National Forest, Forest Plan Best Management Practices Evaluation, SD – Senior technical lead on an analysis of the Best Management Practices (BMPs) in the Black Hills

National Forest Plan. The Black Hills Forest Plan and Final Environmental Impact Statement (FEIS) reference several BMPs, Standards and Guidelines (S & G), and mitigation measures to ensure compliance with Forest Plan objectives and relevant environmental laws, including the Clean Water Act and the Endangered Species Act. This project identified these measures and analyzed related published research that describes the effectiveness of the measures in meeting their stated goals.

Colorado State Forest Service, USDA Forest Service; Denver Water, EPA, Upper South Platte Watershed Landscape Assessment, Front Range, CO - Served as watershed lead for a landscape assessment on the Upper South Platte Watershed that was completed in 90 days. This watershed provides the majority of the drinking water for the City of Denver and is an area of increasing development. Assessed the ecological condition of the 640,000-acre watershed, compare it to historic (reference) conditions and make recommendations for restoration. Made recommendations to reduce tree density, create openings and more landscape oriented approaches to reducing fire risk. Stream classifications were completed on 282 miles of stream. Over 110 wildlife species were examined. Extensive vegetation, soils and water analyses were completed on the 640,000-acre assessment area using GIS techniques.

USDA Forest Service, Santa Fe National Forest, Viveash Fire Environmental Impact Statement, Pecos, NM – Watershed lead for an environmental impact statement (EIS) for the Viveash Fire Restoration Project. This project would salvage 7,000 acres of trees burned in the Viveash fire. The project is highly controversial and includes extensive public involvement. Key issues are water quality, erosion/sediment yield and wildlife impacts. The watershed task involved modeling sediment yield from forest restoration activities using WEPP.

Sierra Pacific Industries; Upper Mokelumne Landscape Assessment, Sierra Nevada Mountains, CA – Watershed lead for a landscape assessment on the Upper Mokelumne Watershed. This project categorized watersheds based upon environmental concerns of forest management. The assessment ranked subwatersheds based upon risk of concern by key issues. Developed the watershed methodology for issues of soils, sediment transport/deposition and peakflows. Management recommendations were generated that would be implemented based upon risk through Timber Harvest Plans.

USDA Forest Service; Denver Water Board, Colorado State Forest Service, Upper South Platte Watershed

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Environmental Assessment, Front Range, CO –Served as watershed technical lead on an environmental assessment on the Upper South Platte Restoration Project. This project would restore over 17,000 acres of over-dense forest to more sustainable conditions, restore riparian and upland forest habitat in Buffalo Creek, reclaim 25 miles of unclassified road and improve trails in the Waterton/Deckers, Horse Creek and Buffalo Creek watersheds. The watershed task involved modeling sediment yield from forest restoration activities using WEPP.

USDA Forest Service, Routt National Forest; Deadman Gulch Environmental Assessment, Yampa Ranger District, CO - Hydrologist and assistant project manager for hydrology, water quality, fisheries analyses and technical management for an EA that evaluated timber harvesting on the Yampa Ranger District in Colorado.

USDA Forest Service; Idaho Panhandle National Forests; Mosquito-Fly Environmental Impact Statement, Avery, ID – Watershed lead for an EIS for a roadless area in Northern Idaho that evaluated an access request from Plum Creek Timber Company. The project area was checkerboard ownership with Plum Creek. Some of the alternatives included USDA Forest Service harvesting. The roadless area contained three of the few remaining unentered bull trout streams in the Upper St. Joe watershed. Completed analyses for channel stability, water quality and fisheries using WATSED and rain-on-snow modeling. Extensive field data collection for sediment yield modeling. Completed a BA/BE for fisheries.

USDA Forest Service, Idaho Panhandle National Forests; Packsaddle Environmental Impact Statement, Sandpoint, ID – Watershed Lead for an EIS for timber harvesting and road building in a large roadless area in northern Idaho. Completed analyses for channel stability, water quality and fisheries using WATSED and rain-on-snow modeling. Extensive field data collection for sediment yield modeling. Completed a BA/BE for fisheries.

USDA Forest Service, Idaho Panhandle National Forests; Katka Peak Environmental Impact Statement, Bonners Ferry, ID - Provided forest hydrology expertise for an EIS for timber harvesting and road building in a large roadless area in northern Idaho. Completed analyses for channel stability, water quality and fisheries using WATSED and rain-on-snow modeling. Extensive field data collection for sediment yield modeling. Completed a BA/BE for fisheries.

Project Experience – Facilitation/ Public Involvement

Nellis Dunes OHV Special Recreation Area, Las Vegas, Nevada – Facilitator for an Inter-entity partnership between BLM, Nellis Air Force Base and Clark County. Designed, setup and facilitated public meetings for gathering public opinion on the potential transfer of Nellis Dunes OHV SRA to Clark County. Worked with the Inter-entity partnership following an analysis of comments that resulted in a change in approach to leave most land in BLM management and transfer a small portion to Clark County.

Colorado State Forest Service, USDA Forest Service; Denver Water, City of Aurora, BLM, USGS, NRCS, Front Range Roundtable, Data Refinement Group, CO - Served as facilitator and technical lead for the development of a watershed prioritization approach to be used in the 10 county Front Range Fuels Treatment Partnership in Colorado. Developed draft technical approaches for prioritization of watersheds based upon responses to intense wildfires associated with water diversions and other infrastructure. Applied test case to Upper South Platte Watershed. Facilitation of this technical group was especially challenging due to the importance of identifying critical watersheds for treatment in Colorado.

White Mountains Landscape Assessment, Northern Arizona University, Forest ERA Project, Flagstaff, AZ – Served as workshop facilitator that completed prioritization of geographic areas and management options in three days lead for the 2.1-million acre White Mountains Landscape Assessment including all the Apache-Sitgraves National Forest in eastern Arizona.

BLM, Casper Field Office, Casper Planning Area Resource Management Plan and EIS, Wyoming - Served as a facilitator for a weeklong collaborative workshop in Casper between BLM ID Team staff and cooperators. This workshop developed a reasonable range of alternatives to satisfy NEPA compliance requirements.

Public Participation Plans, public meetings, comment analysis and using identified issues in modifying the project approaches were all part of the following list of projects.

Pike National Forest; Catamount Forest Health and Hazardous Fuels Reduction Project Environmental Assessment, Pikes Peak Ranger District, CO

San Isabel National Forest; East-Central Wet Mountains Hazardous Fuels Reduction and Forest

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Restoration Project Environmental Assessment, San Carlos Ranger District, CO

Modoc National Forest (USFS), Alturas and Eagle Field Offices (BLM), and Modoc County, Sagebrush Steppe EIS, Northeast CA

USDA Forest Service, Santa Fe National Forest, Viveash Fire Environmental Impact Statement, Pecos, NM

BLM St. George Field Office, St. George OHV RMP Amendment and EIS, St. George, UT

USDA Forest Service; Denver Water Board, Colorado State Forest Service, Upper South Platte Watershed Environmental Assessment, Front Range, CO

USDA Forest Service; Idaho Panhandle National Forests; Mosquito-Fly Environmental Impact Statement, Avery, ID

USDA Forest Service, Idaho Panhandle National Forests; Packsaddle Environmental Impact Statement, Sandpoint, ID

USDA Forest Service, Idaho Panhandle National Forests; Katka Peak Environmental Impact Statement, Bonners Ferry, ID

US Army Corps of Engineers; Colorado Water Conservation Board, Chatfield Reservoir Reallocation Feasibility Study and EIS, Denver, CO

Project Experience – NEPA

USDA Forest Service, Pike National Forest; Catamount Forest Health and Hazardous Fuels Reduction Project Environmental Assessment, Pikes Peak Ranger District, CO - Project Manager and hydrologist on an environmental assessment (EA) under the Healthy Forests Restoration Act (HFRA) that would treat approximately 20,000 acres within the 100,000 acre Catamount Project Area to restore the montane forest ecosystem towards its historic conditions. This project would also protect public watersheds from wildfires using the analysis from JW Associates work on the Pikes Peak Watershed Assessment.

USDA Forest Service, San Isabel National Forest; East-Central Wet Mountains Hazardous Fuels Reduction and Forest Restoration Project Environmental Assessment, San Carlos Ranger District, CO - Project Manager and hydrologist on an environmental assessment (EA) under the Healthy Forests Restoration Act (HFRA) that would treat approximately 33,600 acres within the East-Central Wet Mountains Project Area to restore the montane forest ecosystem towards its historic conditions. This

project would also protect public watersheds and the wildland-urban interface (WUI) from wildfires.

USDA Forest Service, Black Hills National Forest, Northern Hills Ranger District, West Rim EIS, SD – Served as Project Manager and Hydrologist for the West Rim EIS. This project had a combined US Forest Service and JW Associates technical team. We completed the project in less than one year with excellent cooperative work between the agency and JW Associates. The purpose of the project is to reduce the wildfire risk and potential of Mountain pine beetle infestation primarily in the Ponderosa pine forests of the Northern Hills Ranger District of the Black Hills National Forest. Treatments include thinning, prescribed fire and wildland urban interface treatments.

USDA Forest Service, Washington Office, Streamlining NEPA – Participated as a subject matter expert in a modeling exercise designed to identify process difficulties with the National Environmental Policy Act (NEPA) as applied to USDA Forest Service projects. This project (Reflecting Complexity & Impact of Laws on a USDA Forest Service Project) was used as support to Process Predicament – How Statutory, Regulatory and Administrative Factors Affect National Forest Management, a policy document that the Chief of the USDA Forest Service issued in June 2002.

Modoc and Lassen National Forests (USFS), Alturas and Eagle Field Offices (BLM), and Modoc County, Sagebrush Steppe EIS, Northeast CA – Project manager and NEPA lead for a landscape-scale EIS covering 6.5 million acres. This project will establish direction for restoration of areas that have been invaded by juniper over the last 100+ years. Management direction will include various treatments covering up to 50,000 acres per year for the next 20-30 years.

USDA Forest Service, Payne Gulch Environmental Assessment, Pike National Forest, Morrison, CO – Authored the Payne Gulch Environmental Assessment (EA) for wildfire hazard reduction around summer residences on National Forest lands near Bailey, Colorado. The project would reduce fuels around summer residences and nearby recreational facilities through thinning, created openings and prescribed fire.

General Services Administration (GSA), Great Falls New Federal Courthouse Environmental Assessment, Great Falls, MT - Project Manager and NEPA Lead for an environmental assessment for the lease construction of a new federal courthouse in Great Falls, Montana. Issues included moving out of the

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existing courthouse in downtown to a location across the Missouri River, potential recreation use impacts to the adjacent park, traffic increases, historic structure and bald eagle nesting impacts. The work included writing the draft and final EA, content analysis of public comments and some technical analysis.

USDA Forest Service, Upper South Platte Restoration Project, Changed Condition Assessment, Pike National Forest, Morrison, CO – Completed a changed condition analysis for the Upper South Platte Restoration Project Environmental Assessment (EA). The changed condition analysis was necessary because 6,000 acres of the treatment areas approved in the NEPA decision were burned in the Hayman Fire. Through this analysis the treatment acres were successfully moved to another location in the project area.

USDA Forest Service, Santa Fe National Forest, Viveash Fire Environmental Impact Statement, Pecos, NM – Project manager for an environmental impact statement (EIS) for the Viveash Fire Restoration Project. This project would salvage 7,000 acres of trees burned in the Viveash fire. The project is highly controversial and includes extensive public involvement. Key issues are water quality, erosion/sediment yield and wildlife impacts. The watershed task involved modeling sediment yield from forest restoration activities using WEPP.

BLM St. George Field Office, St. George OHV RMP Amendment and EIS, St. George, UT – Managed the St. George OHV RMP Amendment and EIS for BLM in the Mojave Desert in Utah. This project was an RMP Amendment and EIS for OHV route designation throughout Washington County, Utah. Project is an amendment to the recent RMP, focusing on OHV issues and addressed several highly controversial issues including: OHV route designation, and recreation use conflicts with federally listed plants and animals. Mr. Piehl was the project manager and public involvement lead. This project involved three public meetings with over 200 people attending.

National Park Service, Arches National Park EA, Moab, UT – Managed an environmental assessment for Arches NP that would allow for replacement of the visitor center and realignment of the entrance road. Key issues are safety and visitor impacts.

USDA Forest Service; Denver Water Board, Colorado State Forest Service, Upper South Platte Watershed Environmental Assessment, Front Range, CO – Served as project manager on an environmental assessment on the Upper South Platte Restoration Project. This project would restore over 17,000 acres of over-dense

forest to more sustainable conditions, restore riparian and upland forest habitat in Buffalo Creek, reclaim 25 miles of unclassified road and improve trails in the Waterton/Deckers, Horse Creek and Buffalo Creek watersheds. The watershed task involved modeling sediment yield from forest restoration activities using WEPP.

USDA Forest Service, Routt National Forest; Deadman Gulch Environmental Assessment, Yampa Ranger District, CO - Hydrologist and assistant project manager for hydrology, water quality, fisheries analyses and technical management for an EA that evaluated timber harvesting on the Yampa Ranger District in Colorado.

BLM, Casper Field Office, Casper Planning Area Resource Management Plan and EIS, Wyoming - Served as a facilitator for a weeklong collaborative workshop in Casper between BLM ID Team staff and cooperators. This workshop developed a reasonable range of alternatives to satisfy NEPA compliance requirements.

BLM, Phoenix, Agua Fria National Monument/Bradshaw-Harquahala Planning Areas RMPs and EIS, Arizona - Served as NEPA compliance and physical resources technical lead for two RMPs and an EIS for a planning area of more than 3 million acres north and west of Phoenix. The large, complex project is defining land use goals throughout this portion of the Sonoran Desert, which each year provides recreational and other opportunities for tens of thousands of people from the Phoenix metropolitan area and elsewhere.

BLM, Dolores, Colorado—Canyons of the Ancients National Monument RMP and EIS - Served as project manager, NEPA and physical resources lead for creation of an RMP/EIS for the Canyons of the Ancients National Monument in southwestern Colorado. This new National Monument contains one of the highest densities of cultural resources in the United States. Project activities include scoping, public involvement, alternatives development, water resource and biological baseline assessment, environmental impact analysis, and review of all resource analyses to ensure NEPA compliance.

Project Experience – Water Quality

US Army Corps of Engineers; Colorado Water Conservation Board, Chatfield Reservoir Reallocation Feasibility Study and EIS, Denver, Colorado – Managed a project to develop an EIS and other portions of a Feasibility Study for Reallocation of Chatfield Reservoir. The feasibility of reallocation of

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storage at Chatfield from flood control to drinking water was examined. Key tasks included an evaluation of the impacts to recreation facilities and the Preble's meadow jumping mouse by raising the normal pool elevation at the reservoir. Other key tasks included erosion evaluation of raising the normal pool elevation of Chatfield Reservoir.

Denver Water Department; Systemwide EIS and Barr Lake Reclassification, Denver Water System, CO - Provided expert witness testimony before the Colorado Water Quality Control Commission on potential water quality impacts of Two Forks Reservoir and Barr Lake Reclassification.

Caribbean Petroleum Refinery; Mixing Zone Environmental Assessment, San Juan, PR - Lead the revision of an Environmental Assessment completed by another firm four years earlier. The EA was for relocating the wastewater discharge outfall (NPDES) to San Juan Bay. The EA was revised in 2 weeks. Threatened and Endangered species analysis was significantly modified and updated, along with detailed water quality and mixing zone analyses.

Syntex Chemicals Inc.; Evaluation of wildlife ponds, Boulder, CO - Completed a limnological evaluation of a wildlife pond suspected of being contaminated from ground water.

Colorado River Water Conservation District; Muddy Creek Reservoir EIS, Muddy Creek Reservoir, CO - Limnologist responsible for technical review of water quality issues identified during the EIS process.

Denver Water Department; Water quality monitoring, South Platte and Colorado Rivers, CO - Project Manager responsible for design and implementation of an extensive water quality monitoring program. The monitoring program covered the portions of the South Platte and Colorado Rivers (and many tributaries) in the Denver Water system. The monitoring covered all seasons and all streamflow conditions.

Denver Water Department; Two Forks Water Quality Base Case Prediction, and the Systemwide EIS Reservoir Water Quality Review, Denver Water System, CO - Hydrologist, water quality specialist responsible for providing technical support for the water quality modeling and reservoir eutrophication prediction.

US Army Corps of Engineers, Omaha District; Bear Creek Lake Improvement Study, Denver, CO - Project Manager for limnological studies of Bear Creek Lake to assess the potential water quality improvement that would result from changing operations.

Sub-Regional Operating Group and City of Phoenix; NPDES permit evaluation for the 23rd and 91st Ave. WWTPs, Phoenix, AZ - Water quality hydrologist responsible for the evaluation of National Pollution Discharge Elimination System (NPDES) permit water quality limits for two major wastewater treatment plants discharging to the Salt and Gila Rivers. The evaluation included extensive sampling and hypothesis testing and aquatic ecology impact assessments.

North Penn/North Wales Water Authority; Diversion of Delaware River to North Branch Neshaminy Creek, PA - Provided water quality, hydrology and limnology expertise for evaluation of the Delaware River, North Branch Neshaminy Creek and Lake Galena for NPDES Permitting. Also completed aquatic ecology support including fish population estimates, electrofishing, etc.

Washington Irrigation District (WIDCO); Lake Management Plan for Skookumchuck River, Washington - Created a lake management plan and conducted predictive water quality modeling (WQRRS) of a reservoir resulting from the filling of an open pit mine on the Skookumchuck River.

Syar Industries; Gravel mining impacts assessment, Russian River, California - Water quality expert/hydrologist for a water quality study to evaluate aggregate mining impacts on the Russian River. Created BMPs and recommendations for mining design that would provide enhanced post-mining fish habitat.

Goldenbell Resources; Pine Tree Project, Mariposa, California - Completed all hydrology and water quality analysis and permitting for a California Environmental Impact Report (EIR) on a proposed heap leach gold mine near the Merced River and Lake McClure in California.

Arizona Public Service; NPDES discharge support, Yuma, AZ - Provided data, analyses and monitoring for NPDES permit negotiations related to discharge of cooling water to Colorado River.

Freeport-Indonesia; Water quality evaluation of copper mine, Irian Jaya, Indonesia - Completed water quality evaluation of the impacts of copper tailings disposal to the Akjwa River. Designed and maintained a continuous streamflow gaging system in the Akjwa River and major tributaries.

Barton Creek Development Company; Barton Creek golf course and residential development, Barton Creek, TX - Evaluated the water quality impacts of a

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residential and golf course development on Barton Creek.

Cherry Creek Basin Authority; Evaluation on In-lake Treatment Options, Cherry Creek Reservoir, CO - Assistant project manager and limnologist responsible for the evaluation of in-lake treatment options to reduce phosphorus concentrations in Cherry Creek Reservoir. Designed and conducted limiting nutrient study of Cherry Creek Reservoir.

Jefferson Associates; Standley Lake reclassification, Standley Lake, CO - Responsible for nutrient modeling, water quality evaluation and testimony preparation for hearings before the State of Colorado WQCC on the reclassification of Standley Lake.

Cucharas Valley Water Utility; Environmental Analysis (EA) of a proposed wastewater treatment facility, Cucharas River, CO - Project manager for EA that assessed the impacts of a proposed wastewater treatment facility on the Cucharas River.

City of Albuquerque; NPDES outfall Permitting, Albuquerque, NM - Completed water quality and aquatic ecology data gathering and assessment for NPDES permit support on the Rio Grande.

City of Roswell; NPDES outfall Permitting, Roswell, NM - Completed water quality and aquatic ecology data gathering and assessment for NPDES permit support.

Salt River Project; Continuous Real-Time Water Quality Monitoring Study, Phoenix, AZ - Researched and designed a continuous real-time water quality monitoring system for the SRP canals through Phoenix.

Confidential Client; Water quality evaluation of Eagle Mine, Eagle River, CO - Provided water quality analyses and expert witness testimony on the impacts of the Eagle Mine on downstream water quality.

Project Experience – Landscape Assessments

Colorado State Forest Service, USDA Forest Service; Denver Water, EPA, Upper South Platte Watershed Landscape Assessment, Front Range, CO - Served as project manager and watershed lead for a landscape assessment on the Upper South Platte Watershed that was completed in 90 days. This watershed provides the majority of the drinking water for the City of Denver and is an area of increasing development. Assessed the ecological condition of the 640,000-acre watershed, compare it to historic (reference) conditions and make recommendations for

restoration. Made recommendations to reduce tree density, create openings and more landscape-oriented approaches to reducing fire risk. Stream classifications were completed on 282 miles of stream. Over 110 wildlife species were examined. Extensive vegetation, soils and water analyses were completed on the 640,000-acre assessment area using GIS techniques.

Sierra Pacific Industries; Upper Mokelumne Landscape Assessment, Sierra Nevada Mountains, CA - Managed a landscape assessment on the Upper Mokelumne Watershed. This project categorized watersheds based upon environmental concerns of forest management. The assessment ranked subwatersheds based upon risk of concern by key issues. Developed the watershed methodology for issues of soils, sediment transport/deposition and peakflows. Management recommendations were generated that would be implemented based upon risk through Timber Harvest Plans.

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White Mountains Landscape Assessment, Northern Arizona University, Forest ERA Project, Flagstaff, AZ – Watershed technical lead for the 2.1-million acre White Mountains Landscape Assessment including all the Apache-Sitgraves National Forest in eastern Arizona. Developed methodology for ranking watershed values and risks for the watershed analysis that was part of the overall assessment. Methodology included ranking potential impacts of wildfire and forest management on soils, sediment transport and deposition, and peakflow/runoff. Completed streamlined GIS stream classification to support the sedimentation analysis. Also served as workshop facilitator that completed prioritization of geographic areas and management options in 3 days.

Northern New Mexico Landscape Assessment, Northern Arizona University, Forest ERA Project, Flagstaff, AZ – Watershed technical lead for the 3-million acre Northern New Mexico Landscape Assessment that includes most of the forested land in northern New Mexico. Developed methodology for

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the watershed analysis that was part of the overall assessment. Methodology included ranking potential impacts of wildfire and forest management on soils, sediment transport and deposition, and peakflow/runoff. Completed streamlined GIS stream classification to support the sedimentation analysis.

USDA Forest Service, Bureau of Land Management, Colorado Division of Wildlife, and Public Lands Partnership; Uncompahgre Plateau Landscape Assessment, Delta, CO – Served as project manager and senior watershed technical lead on a landscape assessment on the Uncompahgre Plateau in western Colorado. This project will direct management across the 1.6 million acre landscape. Collaborative project designed to restore sustainable ecosystem functions to a large landscape. Key issues are declining mule deer populations and increased wildfire risk.

Publications

- Piehl, B.T., H.M. Hampton, Y. Xu, B.G. Dickson, J.W. Prather, T.D. Sisk. 2009. Forest Landscape Models of Soil Erosion, Sedimentation, and Flooding following Stand-replacing Wildfire. Submitted for review by Environmental Management.
- Piehl, B.T., and J.A. Wald. 1995 Conflicts between Water Quality, Private Land Access and Ecosystem Management on U.S. Forest Service land. American Institute of Hydrology, Proceedings of Water Resources at Risk. eds. W.R. Hotchkiss, J.S. Downey, E.D. Gutentag and J.E. Moore. May 1995. p. RA 40-46.
- Piehl, B.T., M.R. Pyles and R.L. Beschta. 1988. Flow Capacity of Culverts on Oregon Coast Range Forest Roads. Water Resources Bulletin. Vol. 24, No. 3. June 1988. p. 631-637.
- Piehl, B. T., R. L. Beschta and M. R. Pyles. 1988. Ditch-Relief Culverts and Low-Volume Forest Roads in the Oregon Coast Range. Northwest Science, Vol. 62, No. 3, 1988. p. 91-98.
- Piehl, B. T. 1986. An Evaluation of Culverts on Small Volume Forest Roads in the Oregon Coast Range. Oregon State University. 78 pp.
- Enos, M., and B. Piehl. 1989 Overcoming Technological Difficulties in Continuous Water Quality Monitoring. Proceedings International Symposium on the Design of Water Quality Information Systems. Colorado Water Resources Research Institute. Information Series No. 61. p. 231-241.