

# *Water Resources*

**Fluvial Geomorphology and Hydrology**

**Stream Restoration and Surveys**

**Stream Gaging and Related Services**

**Water Resources Management**

**Watershed Planning and Management**



**ECORP Consulting, Inc.**  
ENVIRONMENTAL CONSULTANTS

# Fluvial Geomorphology and Hydrology



ECORP staff are experienced in evaluating riparian systems and preparing impact minimization and mitigation strategies for managing the dynamic elements of the fluvial system. Riparian systems are dynamic, and respond to changes in environmental conditions including: climate, vegetation, watershed hydrology, and episodic events, such as landslides. These changes, in turn, affect aquatic habitat, flooding, stream bank stability, riparian habitat, and other functions. Human impacts can greatly alter the natural morphology through direct impacts, such as channelization and dams, or indirect impacts such as urbanization, which alters the watershed land use/cover. ECORP staff analyze watershed processes and their effects on channel morphology, hydrology, and hydraulics, in order to minimize stream degradation and restore the dynamic balance of the riparian system.

## Services Provided

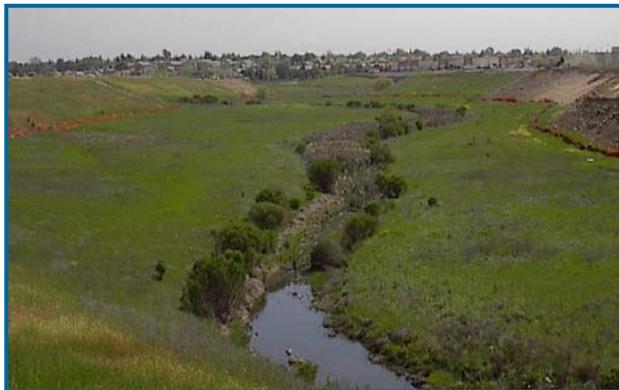
- Hydrologic and hydraulic studies and modeling
- Riparian assessments
  - Stream surveys (Rosgen Classification)
  - Channel complexity
  - Bed characteristics
  - Flow analysis
  - Particle size distribution
- Stream restoration and channel design
- Sediment transport
- Bank erosion assessment and stabilization
- Stream bank stabilization
- Fish passage design and mitigation
- Watershed assessment
- Climate analysis
- Hydrogeomorphic analysis (HGM)



## Stream Restoration and Surveys



ECORP provides engineering design, project management, and construction oversight services for stream restoration projects. ECORP projects are designed to emphasize biotechnical streambank stabilization using native vegetation combined with the best available technology in erosion control. ECORP staff are qualified in hydrology, geomorphology, water resources, landscape architecture, soils science, fisheries and amphibians, wildlife biology, botany, forestry/aboriculture, ecology, resource agency permitting, and environmental planning. ECORP staff include licensed professional soil scientists and registered professional engineers who are certified in the State of California.



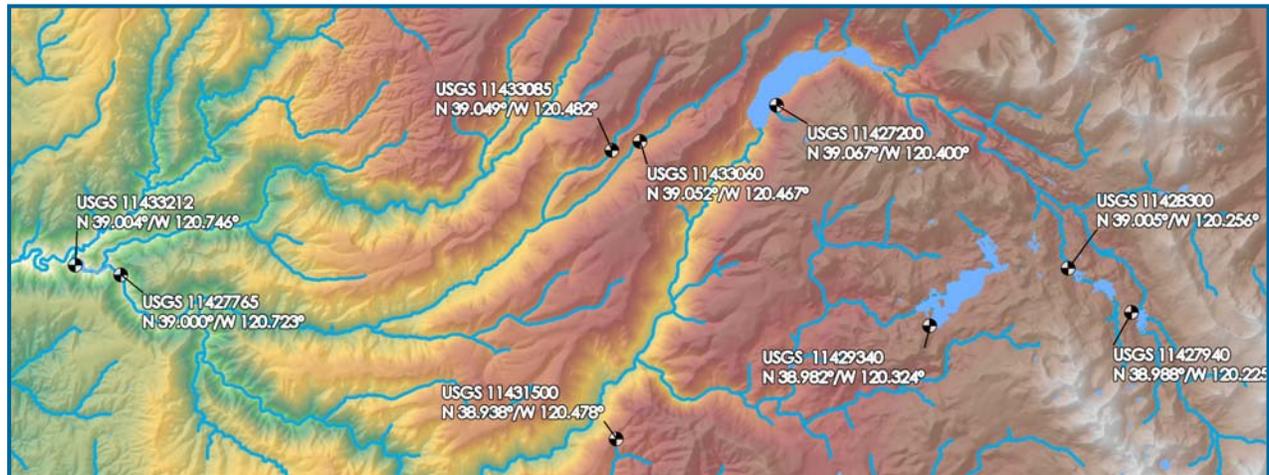
ECORP staff of aquatic scientists include benthic macroinvertebrate ecologists, vegetation specialists, and botanists who have been trained in the use of Rosgen and U.S. Forest Service methodology for comprehensive stream surveys. We perform ecological habitat mapping, biological inventory, and fluvial geomorphologic stream assessment and analysis to produce a comprehensive and natural restoration design.

### Services Provided

- Natural channel design and channel bed reconfiguration/realignment
- Channel hydrology and hydraulic modeling
- Streambank stability analysis and restabilization plans using biotechnical approaches
- Revegetation plans and landscape design
- Open space drainage projects incorporating wetlands, fish habitat improvements, and other bio-engineered features using native plants
- Watershed hydrology
- Physical habitat assessment and restoration
- Sediment and bedload transport analysis and erosion studies
- Stream surveys, substrate analysis, and habitat mapping
- Rosgen stream classification
- Stream cross-section establishment and monitoring
- Operations and Management Plans (O&M) and success criteria monitoring
- Project management and construction observation



## Stream Gaging and Related Services



ECORP offers complete surface water gaging services, including installation, operation and maintenance, field data collection, data analysis, and development of stream flow, diversion and storage records in accordance with U.S. Geological Survey (USGS) standards. Electronic records are developed using USGS approved software. ECORP also offers maintenance, service, and data collection and record development of weather stations and water temperature loggers.

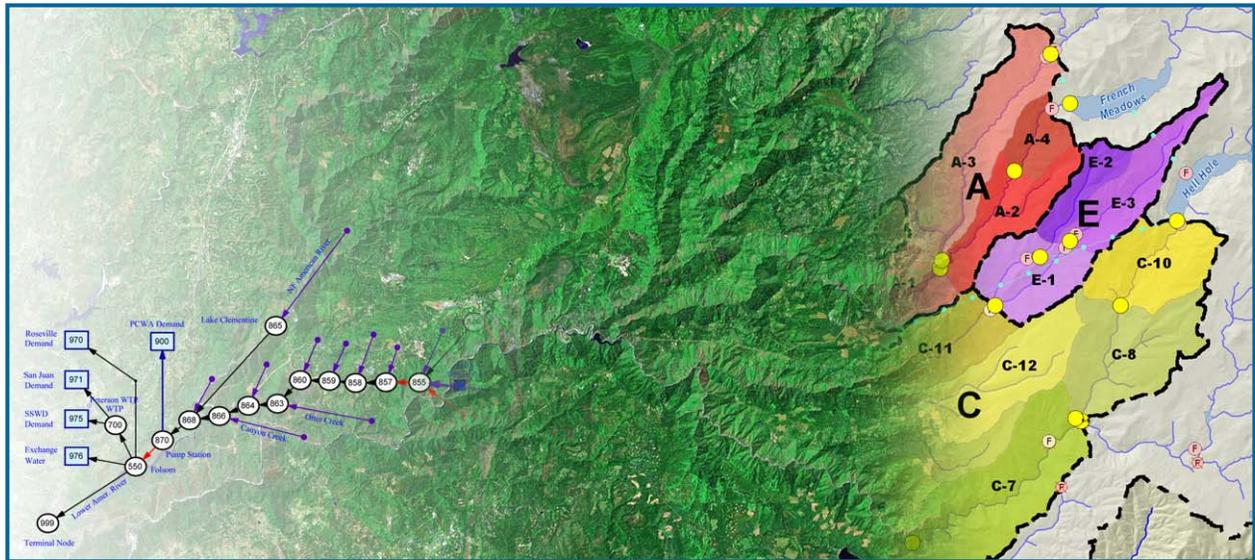
Our gages have been used for both Federal Energy Regulatory Commission (FERC) compliance and to provide operational information. ECORP also has extensive environmental permitting expertise to obtain permits necessary for gage placement and Geographic Information System (GIS) mapping capabilities to calculate the watershed area.

### Services Provided

- Site assessment and gage installation
- Gage repair and maintenance
- Calibration and rating curve development
- Data collection
- Measurements using USGS (type AA & Pygmy) current meters
- Field measurements using bridgeboard, bank operated or manned cableway, boat and wading measurement methods
- Staff gage installation
- Supervisory Control And Data Acquisition (SCADA) integration
- Integrated submeter Global Positioning System (GPS) site surveying and GIS mapping
- Water temperature monitoring
- Snow surveys
- Environmental compliance



# Water Resources Management



ECORP specializes in assisting clients to develop innovative, yet practical solutions to complex environmental planning, management and design issues. ECORP provides complete resource analysis, including consideration of multiple conflicting objectives and integrated system management.

OASIS, developed by HydroLogics, Inc., is a comprehensive water resources systems modeling software, and is a primary tool used in our analysis. OASIS, with its patented Operations Control Language, allows us to help our clients find workable solutions to their water resources management problems in a timely and cost-effective way.

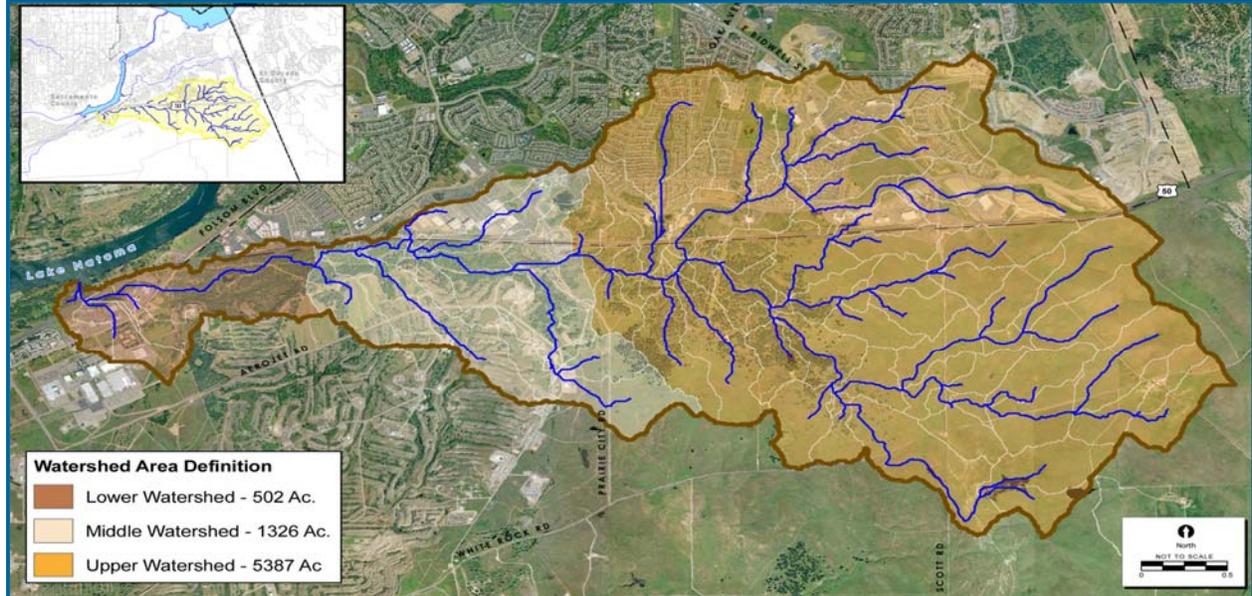
ECORP offers Computer-Aided Negotiations (CAN) and operations exercises in multi-objective, multi-party mediation and conflict resolution. CAN sessions, using OASIS, provide a forum to quickly evaluate alternative solutions to these conflicts. These techniques have been successfully used to help resolve possible contentious, high profile, water resources conflicts.

## Services Provided

- Water supply evaluation
- Hydroelectric system evaluation
- Water rights analysis
- Computer-Aided Negotiation (CAN)
- Water marketing
- Federal Energy Regulatory Commission (FERC) licensing and project operations
- Integration with Physical/Habitat Models (e.g., PHABSIM, SNTemp.)



# Watershed Planning and Management



Planning and management on a watershed basis makes practical sense with regard to natural resources and ecosystem functions; in particular, the quality and quantity of water and its effect on the local human, biological, and physical environment.

At ECORP, we use a diverse team of natural resource scientists who work together to provide an analytical approach to watershed planning and management. We balance constraints and opportunities to achieve project goals within the watershed. Our staff use scientific analysis and state of the art Global Positioning System (GPS) technology and computer-based mapping technologies to assess watershed conditions. Based on watershed assessment and data gaps analysis, we support informational meetings, collaborative processes, and regulatory agency liaison to prioritize management goals and strategies. ECORP also provides effective solutions for managing watersheds across political and jurisdictional boundaries.

## Services Provided

- Watershed management plans
- Environmental assessments
- Technical advisory to collaborative processes
- Agency liaison
- Water quality monitoring programs, planning, data review, and data analysis
- Watershed modeling (hydrology, hydraulics, erosion, sediment, chemical transport)
- Flood control management and design of flood control structures
- Fish passage design and mitigation
- Fluvial geomorphology and stream/lake restoration
- Best Management Practices (BMPs) for erosion control, water quality and storm water detention
- Storm water pollution prevention planning and monitoring
- Preservation, mitigation, and restoration of endangered and threatened species habitat
- Recreational opportunities analysis and planning
- Land use planning and landscape design

