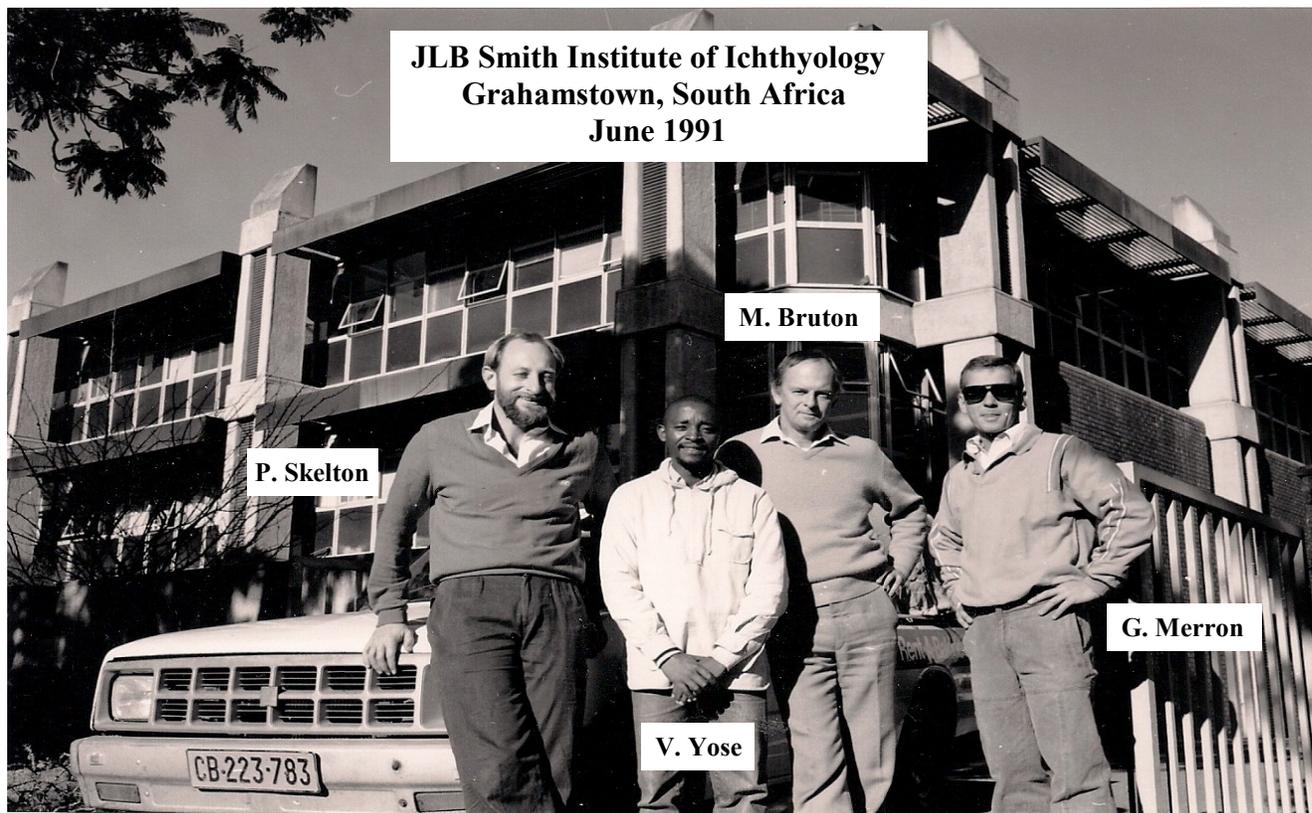


RESUME GLENN S. MERRON FISHERIES AND NATURAL RESOURCE CONSULTANT RENO, NEVADA



January 2012



INLAND ECOSYSTEMS

3239 Reno Vista Drive

Reno, Nevada

USA 89512

Phone: USA + (775) 786-3223

email: gmerron@inlandecosystems.com

www.inlandecosystems.com

RESUME

GLENN S. MERRON

EDUCATION

Ph.D., Fisheries Science - Rhodes University, South Africa, 1991

M.S., Natural Resource Management - University of Michigan, 1981

B.S., Zoology (cum laude) - State University of New York at Geneseo, 1978

EXPERTISE

Fisheries and Aquatic Ecology and Management (marine and freshwater)

Regulatory Permitting (CWA 401 and 404 compliance)

Environmental Studies (CEQA/NEPA)

Watershed Assessments

Habitat Restoration

PROFESSIONAL EMPLOYMENT

Inland Ecosystems, President and Senior Aquatic Scientist, 2003 - Present

Garcia and Associates, Senior Aquatic Scientist/Regional Manager, 1999 - 2003

Pyramid Lake Paiute Tribe, Executive Director – Fisheries Department, 1998 - 1999

Huffman & Carpenter Wetland Regulatory Scientists, Senior Scientist, 1996 - 1998

South African Institute for Aquatic Biodiversity, Senior Fisheries Scientist, 1983 - 1995

Michigan Department of Natural Resources, Aquatic Habitat Specialist, 1978 - 1982

State University of New York at Geneseo, Laboratory Animal Technician, 1975 - 1978

PROFESSIONAL EXPERIENCE

I am currently President of Inland Ecosystems and have over 25 years of experience managing aquatic research and management programs for government, NGO and private sector clients. The company provides a wide range of consulting services including biological and cultural resource surveys, reporting, and compliance with state and federal environmental laws. Inland Ecosystems maintains a strong network of professional scientists and archeologists.

I supervise several aquatic resource projects in the USA (outlined below). I am a former Executive Director of the Pyramid Lake Paiute Fisheries program where I was responsible for managing a 23-person staff and a \$25 million dollar endowment.

My accomplishments also include completing several large scale international natural resource management programs for the Okavango Delta in Botswana and the Pongolo Floodplain in Zululand, South Africa. I also served as a Fisheries Consultant for the Eastern National Water Carrier in Namibia and the Highlands Water Project in Lesotho.

I have a solid background in agency consultation and coordination at the local, state, federal and international levels, including extensive public participation on environmental issues. I am well versed in natural resource planning, habitat assessments, and watershed planning. I have a keen understanding of the animal kingdom and have interacted with numerous species during the course of my career. Video and slide presentations of select research projects I have carried out are available to view at (www.inlandecosystems.com). I have presented my research findings in the scientific and popular literature and at various venues worldwide including the USA, Europe, and Africa.

SELECT PROJECT EXPERIENCE

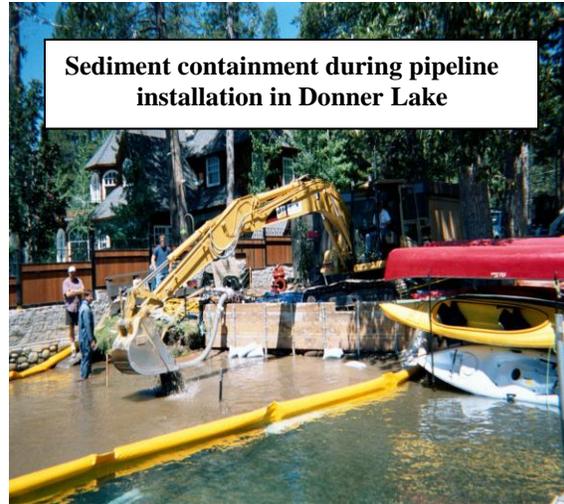
1) Lime Saddle, CA – Del Oro Water Company, Regional Intertie Project via Luhdorff and Scalmanini Consulting Engineers, Inc. (LSCE; 1999 - ongoing)

I serve as Project Manager responsible for preparing and complying with a California Environmental Quality Act (CEQA) Initial Study/Mitigated Negative Declaration for Phase 1 of the Regional Intertie Project including all environmental permitting and reporting. The purpose of the project is to provide a reliable, non-interruptible supply of potable water to the immediate service area and alleviate chronic water shortages in other service areas. Specific mitigation measures to minimize construction related environmental impacts in Lake Oroville and along the pipeline alignment are being implemented. Buffers around Valley elderberry shrubs which are the host plant for the federally endangered valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) were established according to federal guidelines. Phase 1 of the Project is complete and Del Oro is currently reviewing several alternatives for a Phase 2 component of the Intertie Project which will secure additional water supplies and infrastructure for Del Oro and other water districts in the area to meet future demands.



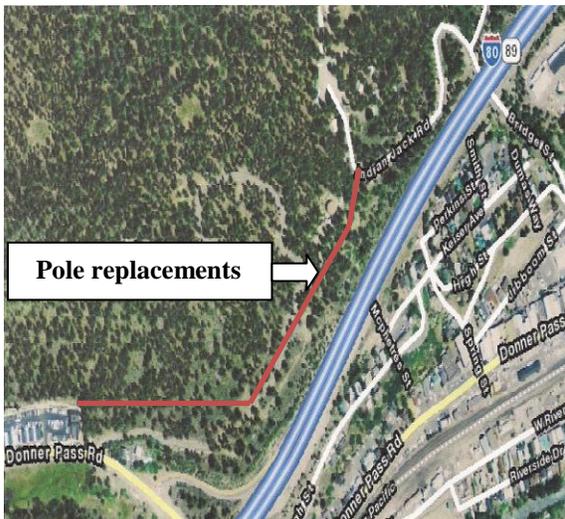
2) Truckee, CA – Truckee Donner Public Utility District (TDPUD; 1999 - ongoing)

Since 1999 I have completed in excess of 50 CEQA documents and regulatory permit applications for the TDPUD Master Plan which entails major improvements to the existing water and electric distribution systems (see Bibliography). I identify mitigation measures to minimize construction related environmental impacts to both aquatic and terrestrial resources. I work closely with the Department of Fish and Game, Regional Water Quality Control Board, U.S. Army Corps of Engineers, and local conservation groups on the majority of TDPUD project actions.



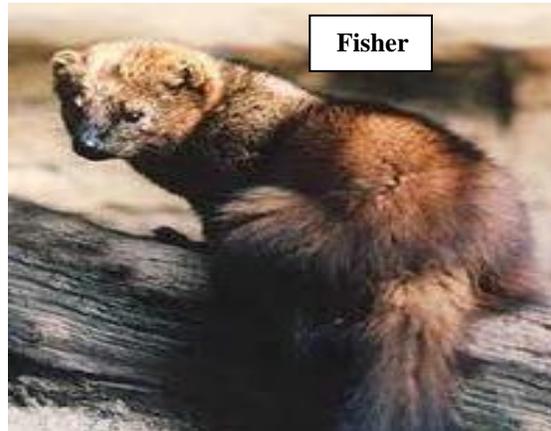
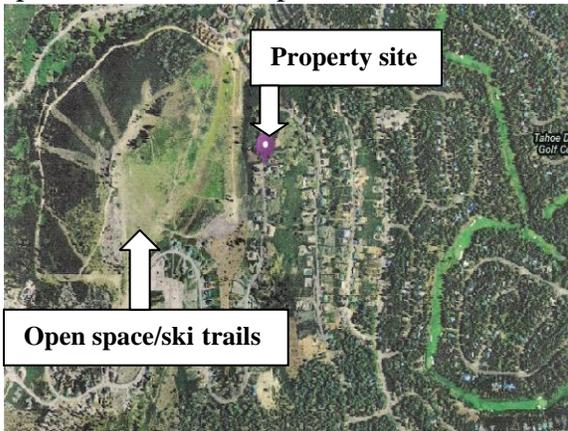
3) Truckee, CA – Truckee Donner Public Utility District, Raptor Surveys (2011)

I was contracted by the TDPUD to carry out a pre-construction raptor and migratory bird survey to assess the presence/absence of special-status species in areas identified for tree removal to install new utility poles. The TDPUD implements an on-going maintenance schedule for tree removal activities along its electric distribution corridors throughout the Town of Truckee. Utility pole replacements are required for public safety and efficient electric transmission. All utility poles were replaced in 2011 without incident to wildlife.



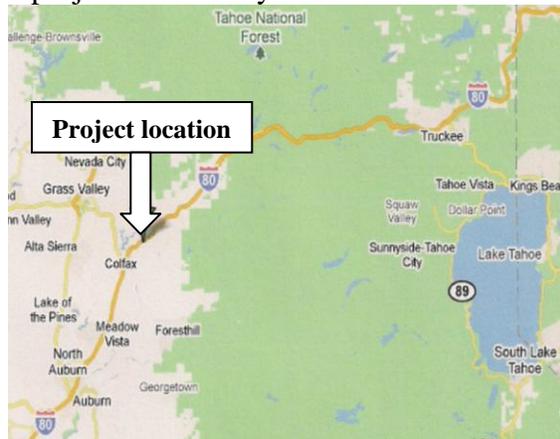
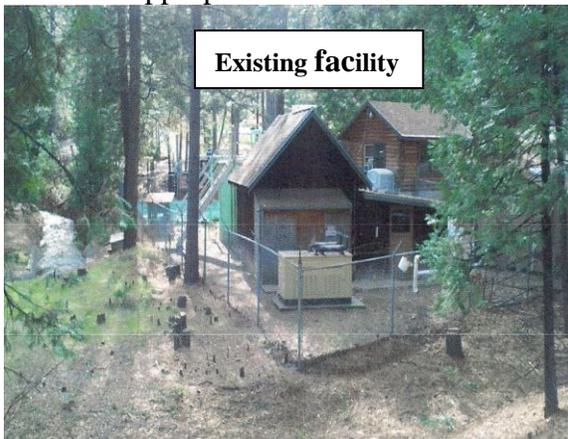
4) Truckee, CA – Setback Variance Application, Habitat Assessment (2011)

I prepared a Botanical and Wildlife Assessment on a property in Truckee as part of a Variance application to the Town Community Development Department. The assessment provided an understanding of the environmental impact that modifying the property may cause. All plant and wildlife species were noted in relation to their ecological function at the site. Adjacent to the property is an area of open space which functions as valuable habitat for numerous mammals, birds, reptiles and plants. Fishers are known in the area. Special-status species *could be* impacted from modifications at the property including loss of well established native vegetation; loss of valuable habitat for a variety of native species; erosion; and potential introduction of invasive weeds.



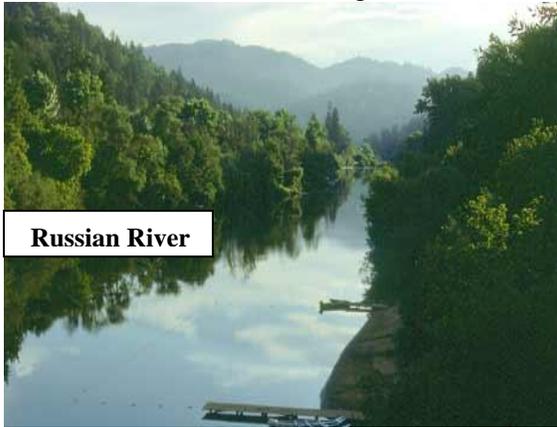
5) Colfax, CA – Alpine Meadows Property Owners Association, Inc. (AMPOA) Water Treatment Plant Project via Sauers Engineering, Inc. (2011)

I prepared a Biological Assessment (BA) for the AMPOA to improve their water treatment facilities by replacing the existing water treatment system and storage tanks. The project is being partially financed by the USDA-Rural Development and requires compliance with the federal Endangered Species Act (ESA). The BA reviewed the Project to determine whether the action would jeopardize the continued existence of any endangered or sensitive species. Biological surveys were carried out in May 2011. No listed animal or plant species were observed. The BA concludes the Project would have “No Effect” on federal species. The BA was submitted to the USDA for this agency to confer an appropriate effect determination. The project is currently under construction.



6) Ukiah, CA – Millview County Water District, Water Acquisition (2010 - 2011)

I prepared a CEQA Initial Study/Negative Declaration for a project action aimed at enhancing the reliability of Millview’s water supply by acquiring up to 750 acre-feet per year of raw water from the Mendocino County Russian River Flood Control and Water Conservation Improvement District. The primary water source supply and storage in the area is Lake Mendocino. The project is comprised solely of modifying current agreements between Millview and the District. No active construction or modification of existing infrastructure was required. The CEQA document presents the justification why the action will not have a significant effect on the environment. The project is complete.



7) Stirling City, CA – Del Oro Water Company Treatment Plant (2010 - ongoing)

I prepared a CEQA Initial Study/Mitigated Negative Declaration for the Stirling City Water Treatment Plant Project. The existing plant is not in compliance with the Surface Water Treatment Rule and must comply with a Notice of Violation (NOV) issued to Del Oro from the Department of Public Health. The NOV requires Del Oro to modify the treatment plant. Storage at the plant is also inadequate to provide water for a maximum day demand. As part of the plant improvements a second storage tank will be installed. The project area was surveyed by a team of archeologist and biologist. The project will not impact any special-status species or cultural resources. Coverage for the project under the State Water Resources Control Board Construction General Permit and preparation of a Storm Water Pollution Prevention Plan (SWPPP) is complete.



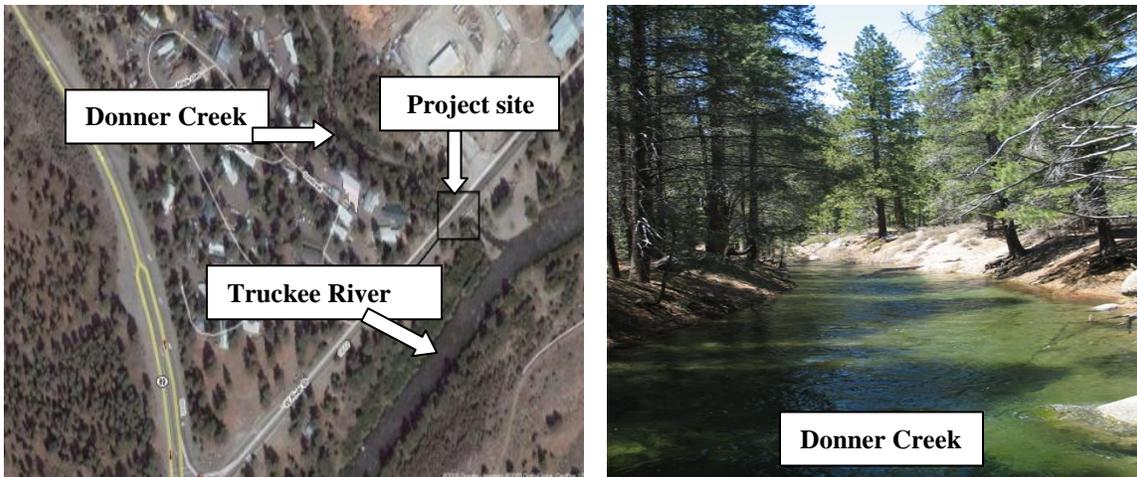
8) Homewood, CA – McKinney Water District (MWD), Pipeline Project (2010)

I prepared a noxious weed plan for the MWD as a prerequisite for a special use permit to access Tahoe National Forest lands to install two parallel water lines 1,230 feet in length leading to a storage tank. Surveys for noxious weed species revealed their absence on U.S. Forest Service land within the project area, although bull thistle was found in isolated patches outside the project footprint. The plan outlines procedures for preventing the introduction of noxious weeds. All equipment was washed before moving into the area to ensure that mud or other debris that could contain invasive seeds was removed. The project footprint was minimized to reduce the amount of ground disturbance. Topsoil was stockpiled and used for onsite re-vegetation. Mulch was applied on the ground after seeding to minimize sediment transport. The project is complete.



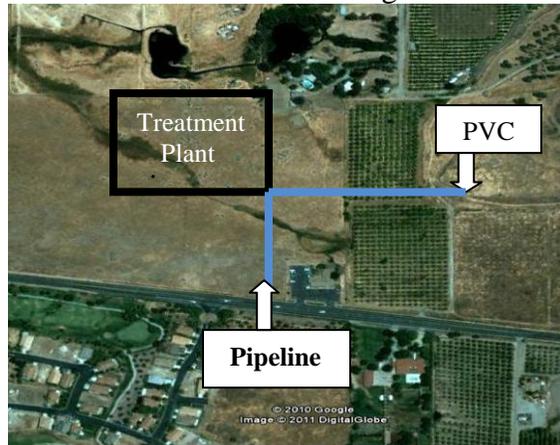
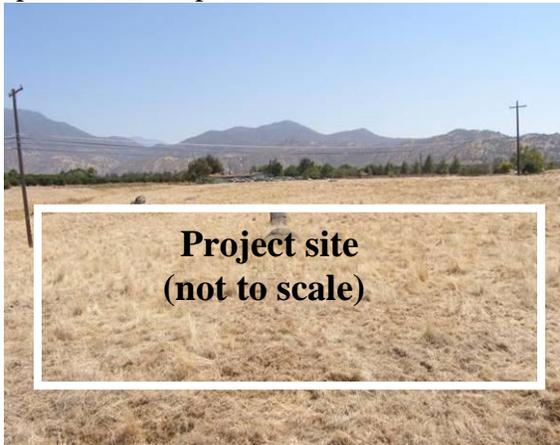
9) Truckee, CA – Truckee Sanitary District, Donner Creek Sewer Crossing (2009)

I served as Project Manager responsible for preparing a CEQA Initial Study/Negative Declaration for the Donner Creek Bridge Sewer Line Replacement Project. The project involved the installation of sewer pipeline to improve sewage capacity and facilitate connection with the future realignment of the Donner Lake outfall pipeline that currently runs along the bank of Donner Creek. No permanent adverse impacts to the channel bed occurred from pipeline installation. Potential temporary effects from construction were avoided through the implementation of erosion control and Best Management Practices to minimize channel habitat and water quality impacts. The project is complete.



10) Springville, CA – Del Oro Water Company, River Island Project (2009-ongoing)

I serve as Project Manager responsible for preparing a CEQA Initial Study/Mitigated Negative Declaration for the River Island Water Treatment Plant in Tulare County including obtaining a Fish and Game Streambed Alteration Agreement, Regional Water Quality Control Board 401 Water Quality Certification, and U.S. Army Corps of Engineers Nationwide Permit. The project objective is to address growing water supply shortages in the area by constructing a new surface water treatment plant to treat water conveyed from the Pleasant Valley Canal (PVC). The project site and adjacent areas were surveyed by a team of archeologists and biologists. The project will not affect any special-status species or cultural resources. Construction is scheduled to begin in 2012.



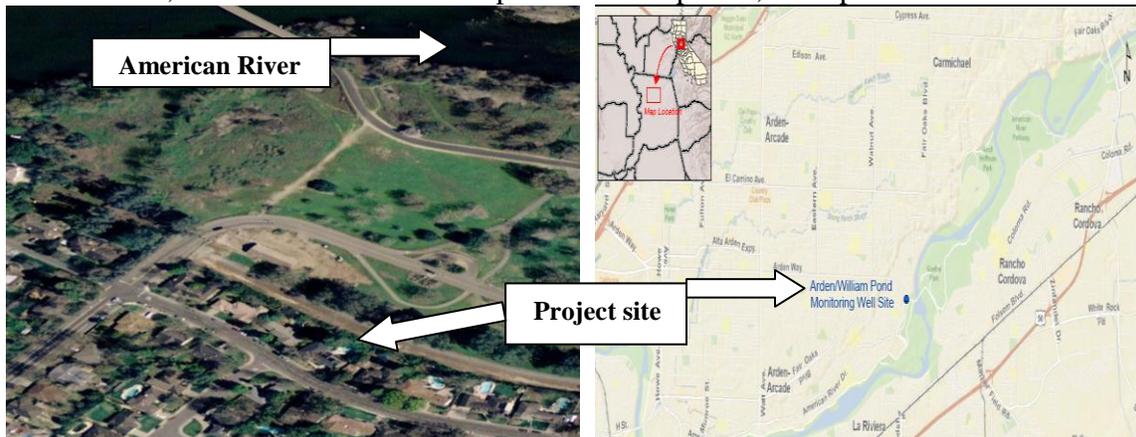
11) Grass Valley, CA – Alta Hill Water Treatment Plant Improvement Project via Sauers Engineering, Inc. (2008 - 2009)

I prepared the Biological and Cultural Resource Assessments for a CEQA Initial Study for the Alta Hill Water Treatment Plant Project. The purpose of the project is to improve the supply of potable water by installing two water storage tanks within the existing plant footprint and yard piping. Inland Ecosystems biologists identified California horned lizards (*Phrynosoma coronatum*) as a species requiring pre-construction surveys for their presence/absence and to establish exclusionary fencing if required. No constraints on cultural resources were identified. The project is complete with no impacts.



12) Sacramento, CA – Sacramento Suburban Water District (SSWD), Arden William Pond Monitoring Well via Luhdorff & Scalmanini (2008 - 2009)

I prepared a CEQA Initial Study that addresses the environmental impacts of drilling and developing the SSWD Arden William Pond Monitoring Well. The well will allow SSWD to sample groundwater for potential contamination from a contaminate plume originating from a nearby commercial facility. Positive Detection of contaminants from the plume in groundwater has forced the deactivation of water supply wells in the vicinity of the facility. The quality of the water collected from the monitoring well is continually analyzed to detect the progression of the plume into the SSWD service area and take appropriate action. Developing the monitoring well did not degrade the quality of the environment, reduce the number of a special-status species, or impact cultural resources.



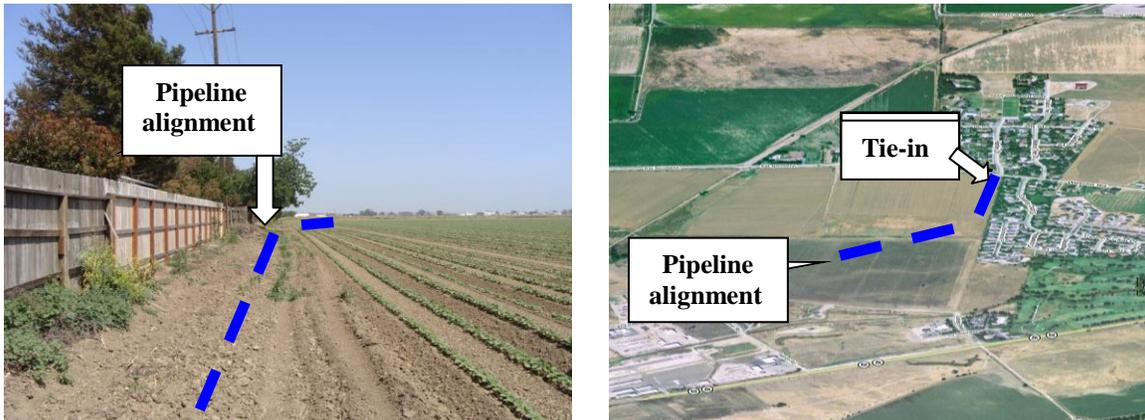
13) Campbell, CA – West Campbell Avenue Pump Station, Storm Water Pollution Prevention Plan (SWPPP) via Conco-West, Inc. (2008)

I prepared a SWPPP for the West Campbell Avenue Pump Station located on an 8,000 foot parcel in the City. Construction activity included trench operations, concrete structures, and station infrastructure. The SWPPP outlines the sources of pollutants associated with the project including sediment, fuel & lubricates, and concrete waste associated with construction. BMP measures were implemented to prevent runoff leaving the work area which was minimal due to the scheduled timing of construction (non-rainy season), the flat terrain, and the containment measures outlined in the SWPPP. The project is complete and permanent BMPs are in place.



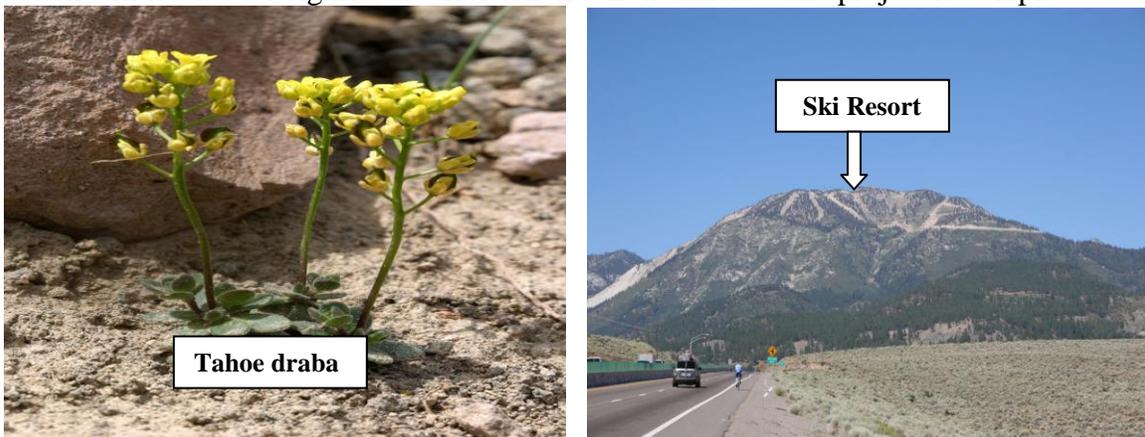
14) Colusa, CA – Del Oro Water Company, Walnut Ranch Use Permit (2008 - 2010)

I prepared a Use Permit application for the County of Colusa, Department of Planning for installation of a pipeline through an agricultural field in order to connect Del Oro’s Walnut Ranch water system to the existing state-licensed Colusa Industrial Park water system. The purpose of this tie-in is to improve drinking water quality and quantity as current wells produce water high in total dissolved solids and can fail. The pipeline runs alongside an existing fence through an agricultural field slated for future residential development. The application required a Biological and Cultural Resource Assessment. There were no impacts to sensitive species or cultural resources associated with construction activities. The project is complete.



15) Reno, NV – Mount Rose Ski Resort, Preparation of a NEPA Environmental Assessment for Ski Trail Improvements (2007 - 2008)

I prepared a NEPA Environmental Assessment (EA) for the 2008 Mount Rose ski trail improvements. The EA includes a discussion of the purpose and need for the project improvements, the environmental impacts of the project, and description of alternatives. The majority of the improvements entailed spot grading to re-contour areas of higher elevation. Of particular concern was the presence of the federally endangered Tahoe draba (*Draba asterophora*) which inhabits U.S. Forest Service lands that comprise areas of the Ski Resort. Mitigation plans were designed to avoid project related impacts. I prepared A Finding of No Significant Impact (FONSI) that presents the reasons why the action will not have a significant effect on the environment. The project is complete.



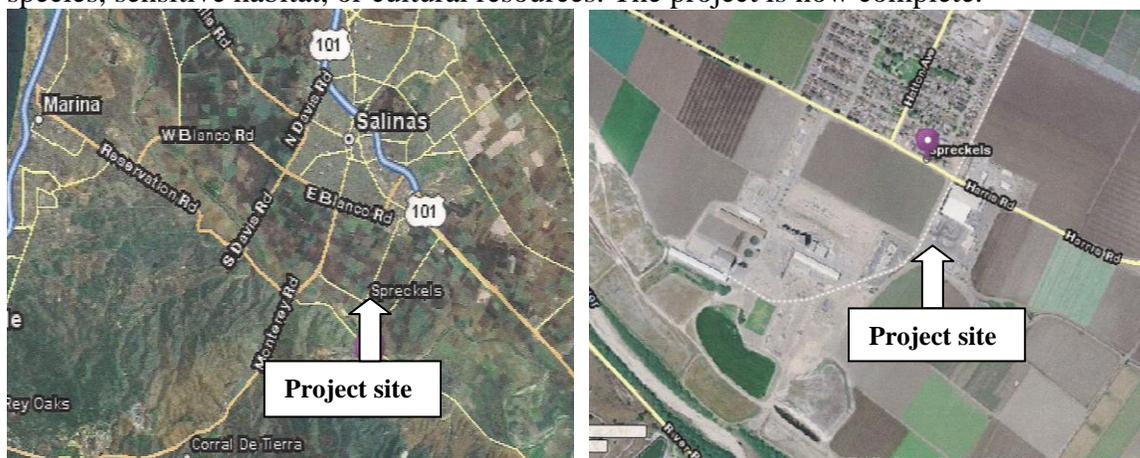
16) Truckee, CA – Martis Creek Benthic Macroinvertebrate Surveys, DMB Highlands Group via Huffman & Carpenter (2006 - ongoing)

I serve as Project Manager for benthic macroinvertebrate (BMI) and habitat surveys in accordance with the procedures for Bioassessments in California. The sampling program was carried out in 2006, 2008, and planned for 2012. The surveys form part of DMB Highlands Group permitting and monitoring under Clean Water Act Section 401 Water Quality Certification. The goal of the assessments is to document the existing conditions of the BMI community in Martis Creek including species composition and environmental factors limiting their distribution and abundance. The data will allow future comparisons to be made with other BMI surveys in the watershed and/or comparable eastern Sierra Nevada streams as the region becomes more developed.



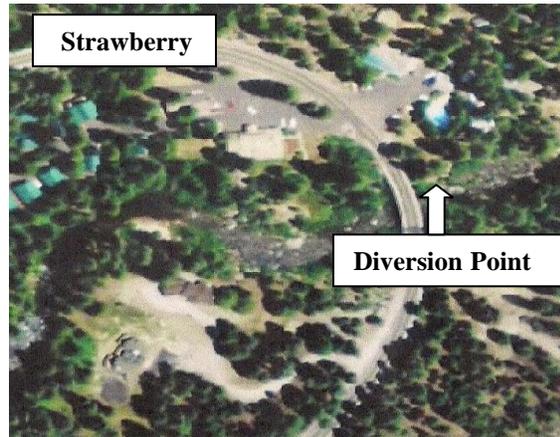
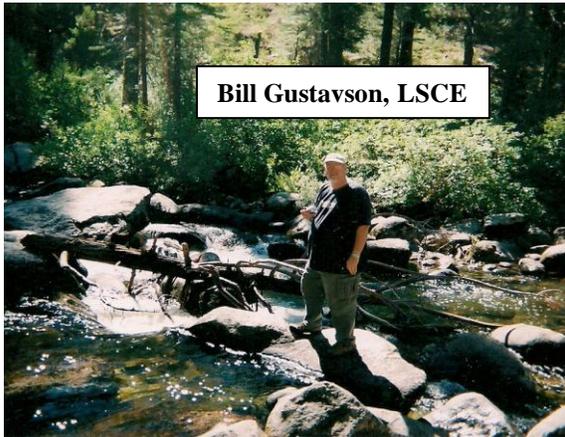
17) Spreckles, CA – Spreckles Water Company via Luhdorff & Scalmanini Consulting Engineers (LSCE; 2006 - 2007)

I was retained by LSCE to prepare a California Department of Public Health Environmental Document for a change of ownership for the Spreckles Water Company in Monterey County. Biological and Cultural Resource Assessments were required as part of the project action. The project site contained no sensitive native habitats (e.g., wetlands). The state and federal special-status databases document occurrences for two amphibians, three birds, two mammals, one reptile, and thirteen plants in the USGS Spreckles quadrangle. The project did not have an adverse effect on any special-status species, sensitive habitat, or cultural resources. The project is now complete.



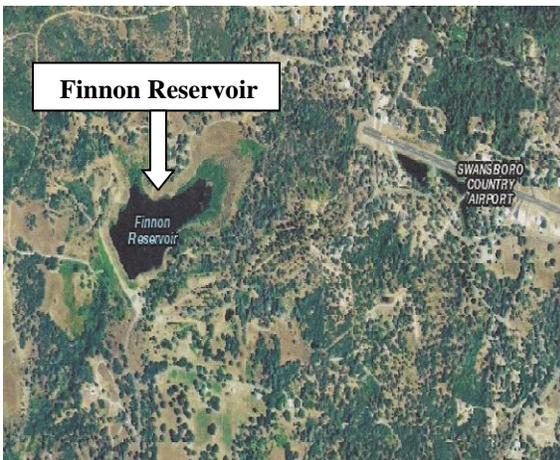
18) Strawberry, CA – Del Oro Water Company via Luhdorff & Scalmanini Consulting Engineers (LSCE), Stanislaus River Diversion (2007 - 2008)

I prepared a Department of Fish and Game - Streambed Alteration Agreement including a Biological Impact Assessment and a Caltrans Water Pollution Control Program (WPCP) for an emergency river diversion from the South Fork Stanislaus River in Tuolumne County. Under normal years, Del Oro typically diverts water from Herring Creek, a tributary to the Stanislaus River. However, under drought conditions, as experienced in 2007 and 2008, diversion is necessary from the South Fork Stanislaus River just upstream of the Highway 108 Bridge. Sediment control and spill containment measures were in place during diversion. There were no impacts from pumping activities.



19) Placerville, CA – Mosquito Valley Fire Department (MVFD), Finnon Reservoir Fish Salvage (2006 - 2007)

I designed a Fish Rescue and Relocation Plan for the Finnon Reservoir Reconstruction Project in El Dorado County. The MVFD recently purchased the reservoir and surrounding land from the Department of Fish and Game. However, the earthen dam is seismically deficient and must be replaced with a new structure. A new dam will allow the reservoir to be refilled and provide important recreational opportunities for the public through increased camping, education, aesthetics, and other amenities. I prepared the fish rescue plan and mitigation measures to ensure that the relocation of fish was conducted with the least amount of trauma.



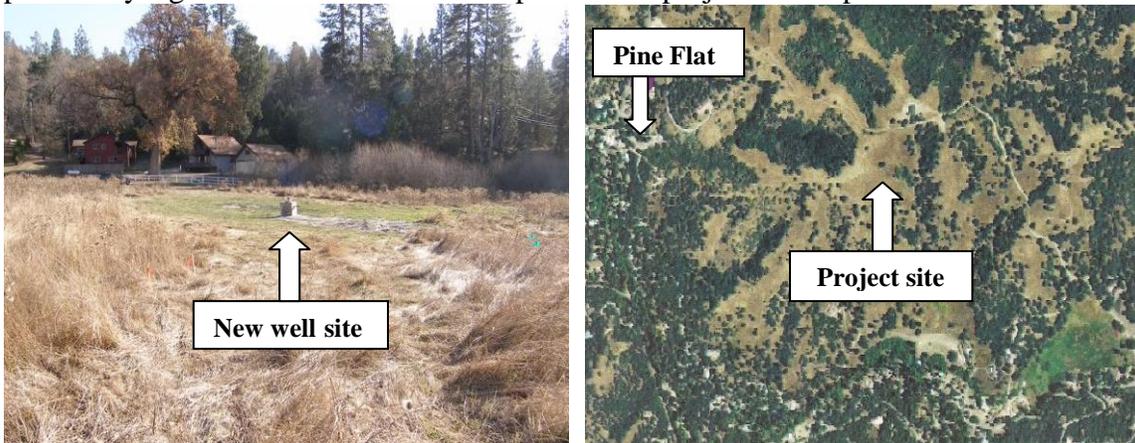
20) Johnson Park, CA – Del Oro Water Company, Water Tank and Pipeline Project (2006 - 2008)

I prepared a CEQA Initial Study/Mitigated Negative Declaration for the Johnson Park Water Tank and Pipeline Project in Shasta County. The project entailed construction of a water storage tank and installation of 1,200 lineal feet of pipeline from the tank to State Highway 299 where an existing water line is located. I was responsible for overseeing a team of biologists and archeologists surveying the project area. The CEQA document addressed the environmental impacts associated with the project. Mitigation measures were incorporated into the project including pre-construction raptor and migratory bird surveys and preparation of a SWPPP. No cultural resources were identified and the project is complete.



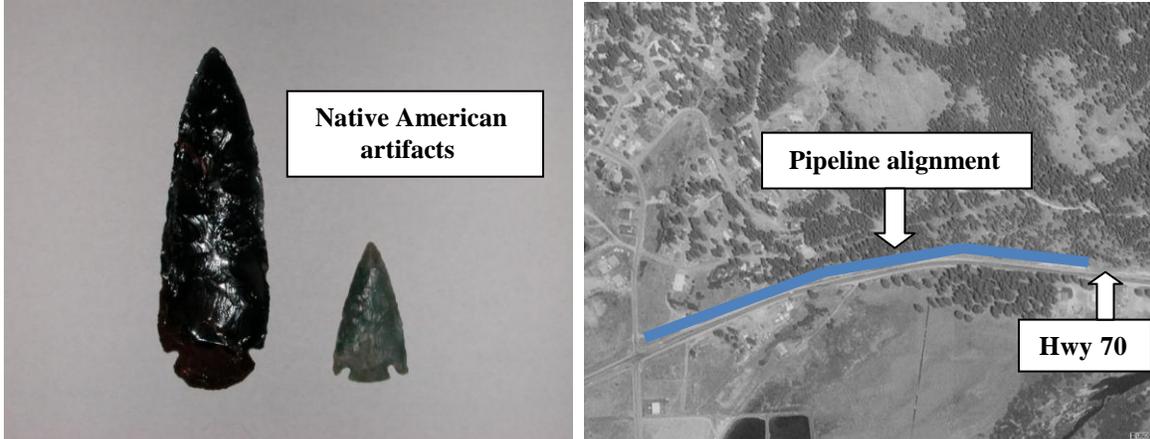
21) Pine Flat, CA – Del Oro Water Company, Pine Mountain Well No. 5 Blending Facility and Well Project (2005 - 2007)

I served as Project Manager responsible for preparing a CEQA Initial Study/Mitigated Negative Declaration which addresses the environmental impacts of constructing the Pine Mountain Well No. 5 Blending facility and well project. The lead agency for the project was the California Department of Health Services. Prior to completion of this project the water system did not have sufficient supply to meet maximum day demands and water outages were common throughout the summer. The new well improves the water system service reliability. Mitigation measures were incorporated into the project to avoid potentially significant environmental impacts. The project is complete.



22) Portola, CA– Grizzly Lake Resort Improvement District, Delleker Pipeline Project via Sauers Engineering, Inc. (2005 - 2006)

I served as Project Manager responsible for preparing Biological and Cultural Resource Assessments for the Delleker Pipeline. The project involved installation of a pipeline along the north shoulder of Highway 70. Surveys for special status species and cultural resources were conducted in August 2005. No special status plant or wildlife species were found during survey work. The Assessments concluded that “No Effect” to federal or state listed species would result from implementation of the project. Exclusionary fencing was placed around a site of cultural artifacts. The project is complete.



23) Sacramento, CA – Sacramento Suburban Water District (SSWD), Verner Avenue Well and Pump Station via Luhdorff & Scalmanini (2005 - 2010)

I prepared a CEQA Initial Study/Mitigated Negative Declaration for the SSWD Verner Avenue Well and Pump Station. The CEQA document addresses the environmental impacts associated with the construction of a well, pumping station, pipeline, and access road. I supervised a team of biologists and archeologists carrying out surveys of the project site. Mitigation measures were incorporated into the project to reduce potentially significant environmental impacts. I worked closely with the Regional Water Quality Control Board to develop a Storm Water Pollution Prevention Plan (SWPPP) for the project site that describes a suite of Best Management Practices (BMPs) and erosion control measures designed to avoid water quality impacts. The project is complete.



24) Oroville, CA – Lake Oroville Area Public Utility District (LOAPUD), Stateline Sewer Rehabilitation Project via Sauers Engineering, Inc. (2005 - 2010)

I served as Project Manager for preparing Biological and Cultural Resource Assessments for a CEQA Initial Study for the Stateline Sewer Rehabilitation Project. In addition, I prepared a Fish and Game-Streambed Alteration Agreement, RWQCB 401 Water Quality Certification, and USACE Nationwide Permit for the project. Inland Ecosystems biologists identified two Environmentally Sensitive Areas (ESAs) along the 5,000-foot pipeline alignment. The first ESA was an intermittent drainage channel where the sewer line crossed. The second ESA was an elderberry shrub (*Sambucus mexicana*), host plant for the federally threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*). I ensured that all mitigation measures stipulated in permits were complied with. No environmental impacts resulted from construction at the two ESAs.



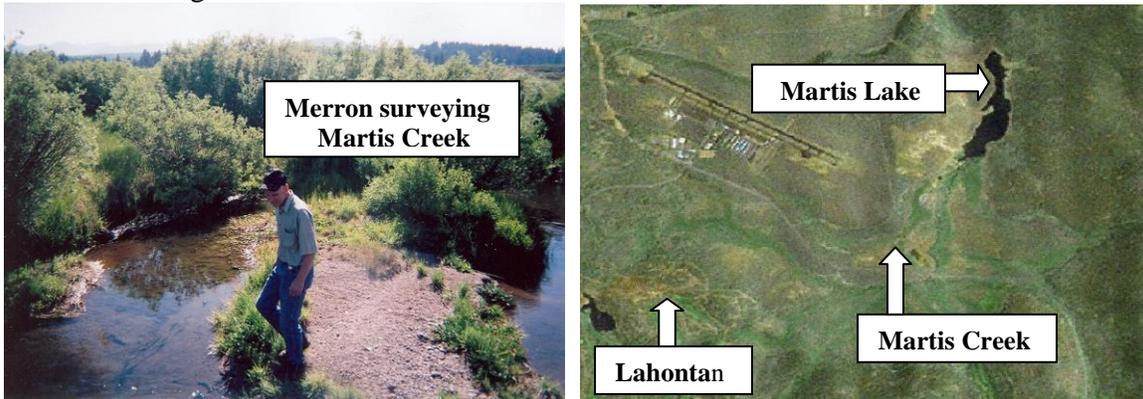
25) Citrus Heights, CA – Mitchell Farms Well and Pump Station, Storm Water Pollution Prevention Plan via Luhdorff & Scalmanini Engineers (2005 - 2006)

I prepared a Storm Water Pollution Prevention Plan (SWPPP) for the Citrus Heights Water District, Mitchell Farms Well and Pump Station. The project is designed to supplement the District's existing water supply during periods of high demand. The SWPPP identified the sources of pollutants that could affect water quality and described the BMPs and erosion control measures that were implemented prior to construction activities to eliminate pollutants in storm water discharges. There were no instances of non-compliance with the SWPPP. The project is now complete.



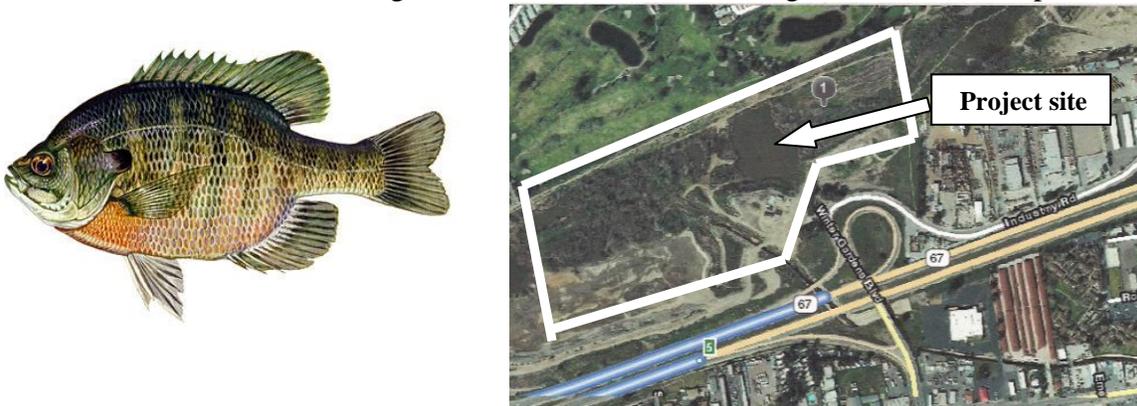
26) Truckee, CA – Martis Water Quality and Aquatic Resource Assessment, DMB Highlands Group via Huffman & Carpenter (2005 - ongoing)

I researched water quality data for Martis Creek and Martis Lake with reference to potential impacts on fisheries and aquatic resources from surrounding land use development. The objective was to determine the adequacy of BMPs and erosion control measures currently in place for protection of water quality within the Lahontan Residential Development. I researched several constituents in relation to species-specific physiological toxicity thresholds for fish. I also described the mechanisms by which other environmental parameters (e.g., different levels of dissolved oxygen, pH, and temperature) could result in synergistic effects to fish within the lake. Based on the water quality data no constituent levels leaving the development would adversely affect aquatic resources living in Martis Lake.



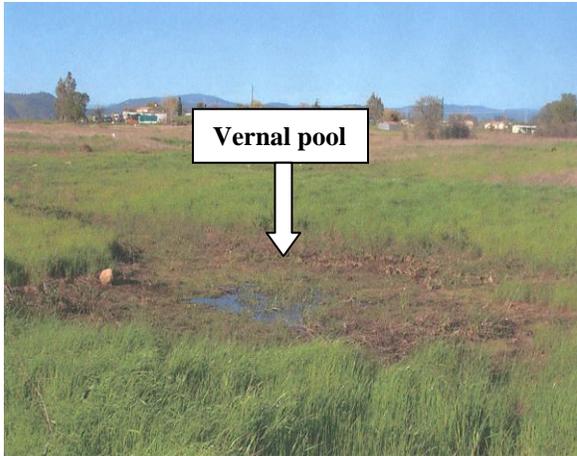
27) Lakeside, CA – Technical Assistance on Aquatic Resources for the Lakeside River Park Conservancy via Huffman & Carpenter (2005 - 2006)

I served on a team of restoration ecologists and was charged with providing an assessment of the fisheries and benthic macroinvertebrate (BMI) communities at a site in San Diego County. The site was formerly used as a landfill for road construction debris including significant deposits of broken asphalt. I researched LC-50 levels and physiological thresholds for specific constituents, particularly asphalt. Two (2) ponds on the site harbor warm-water fish species and “pollution tolerant” BMIs. My report analyzed the potential toxicity to the aquatic environment of removing the road construction debris. I reviewed water quality data collected during 2005-2006 from the site and concluded that removing the fill would not adversely affect aquatic organisms from storm water runoff during excavation or infiltration via groundwater to the ponds.



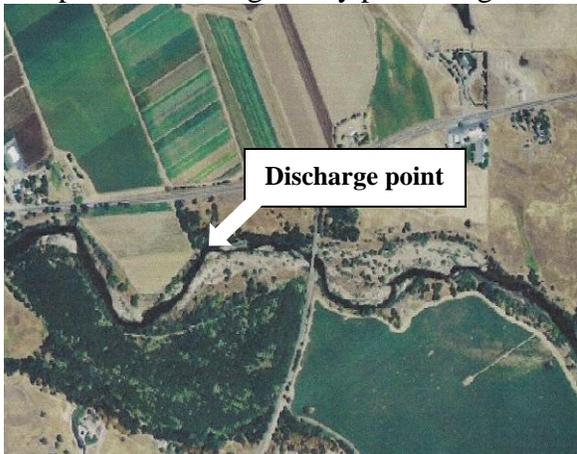
28) Oroville, CA – Lake Oroville Area Public Utility District (LOAPUD), Oak Knoll Sewer Rehabilitation Project via Sauers Engineering, Inc. (2004 - 2006)

I served as Project Manager responsible for CEQA and NEPA compliance and environmental permitting associated with the Oak Knoll Sewer Rehabilitation Project. The project was funded by USDA-Rural Development and consists of replacing and realigning over 8,345 feet of main sewer trunk line southeast of the City of Oroville. Environmental issues included mitigating for temporarily disturbed vernal pool habitat through off-site banking and avoidance of various species of endangered fairy shrimp. The project is complete.



29) Sacramento, CA – Cosumnes River Water Quality Assessment via Foothill Associates (2005)

I prepared a literature based review on levels of settleable solids, total suspended solids (TSS), specific conductance, turbidity, pH, and the relationship to LC-50 toxicity levels and physiological impairments to fish that could be expected to inhabit the Cosumnes River. Water quality data was collected at four locations upstream and downstream of an agricultural discharge point to the river. Toxicity thresholds for several constituents to six fish species were compared to levels in water samples taken above and below the discharge point. My assessment concluded that additional filtering BMPs and erosion control measures were needed at the project site and discharge point to ensure adequate compliance with regulatory permit regulations.



30) Placerville, CA – El Dorado Irrigation District (EID), Habitat Conservation Plan and Natural Community Conservation Planning (HCP/NCCP; 2004 - 2006)

I served as part of a multidisciplinary team developing a comprehensive HCP/NCCP for the EID Capital Improvement Projects. The purpose of the Plan is to identify and survey areas where critical habitat and/or threatened and endangered species exist and describe how to manage developmental projects to avoid, minimize or mitigate take of species (e.g., red-legged frog, goshawks). Development of the Plan provided up front agency consultation which streamlines regulatory review processes. The Plan also addresses cumulative growth-inducing and interrelated/interdependent impact issues.



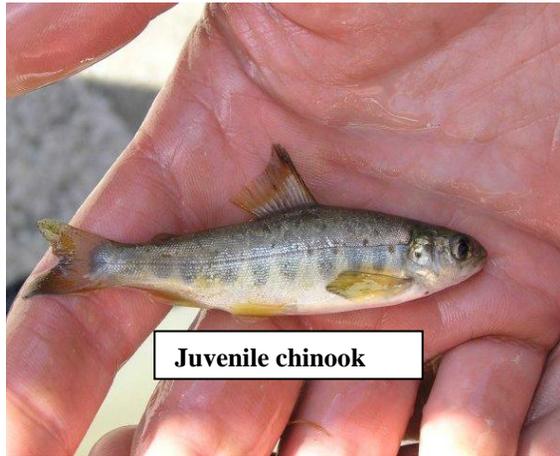
31) Sacramento, CA – Anatolia I & II Project via Foothill Associates (2004 - 2005)

I was retained by Foothill Associates to address eleven specific tasks related to allegations made by the Department of Fish and Game regarding the Anatolia I & II residential development and sediment discharges from the site into Morrison Creek, a tributary to the Sacramento River. I reviewed the Storm Water Pollution Prevention Plan (SWPPP) and environmental reports prepared for the project with specific reference to water quality and regulatory permit conditions. My review provided an assessment of the potential short and long term impact to aquatic resources in Morrison Creek. Several state and federal listed fish and other aquatic organisms are found in the vicinity of the sediment-laden discharge. My report provides recommendations to mitigate potential effects downstream from any future accidental discharge from the project site. I also served as an expert witness for a legal team contesting the magnitude of alleged environmental impact as a consequence of the discharge.



32) Placer County, CA – Technical Assistance to Foothill Associates for the Placer County Water Agency (PCWA) Aquatic Weed Management Program (2004)

I provided fisheries input on the PCWA aquatic weed management program with respect to herbicide application for aquatic weed control in the canal system and potential toxicity to fish, especially listed Chinook salmon and steelhead trout. The PCWA manages 165 miles of canals to convey water throughout its service area. Weed abatement activities are necessary to maintain efficient flow conveyance. I assisted with developing GIS layers depicting the canal system, flow rates, seasonality, and herbicide concentrations. My report describes the potential environmental impacts to fish from herbicide application, mitigation measures including possible biological control, and a monitoring plan.



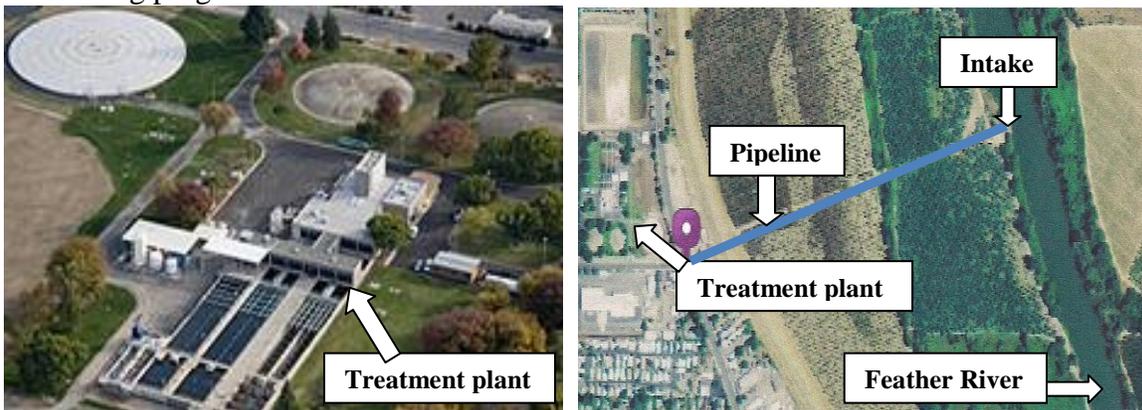
33) Nevada County, CA – Technical Assistance to Foothill Associates for the Nevada Irrigation District (NID) Canal Operations Program (2004 - 2005)

I provided technical advice to Foothill Associates on fisheries issues with respect to the operation of the NID canal system. I assisted with identifying where barriers could effectively prevent fish from migrating upstream in the canals and being impacted by diversion pumps. My report describes the potential operational impacts to fish, mitigation measures, and a monitoring plan.



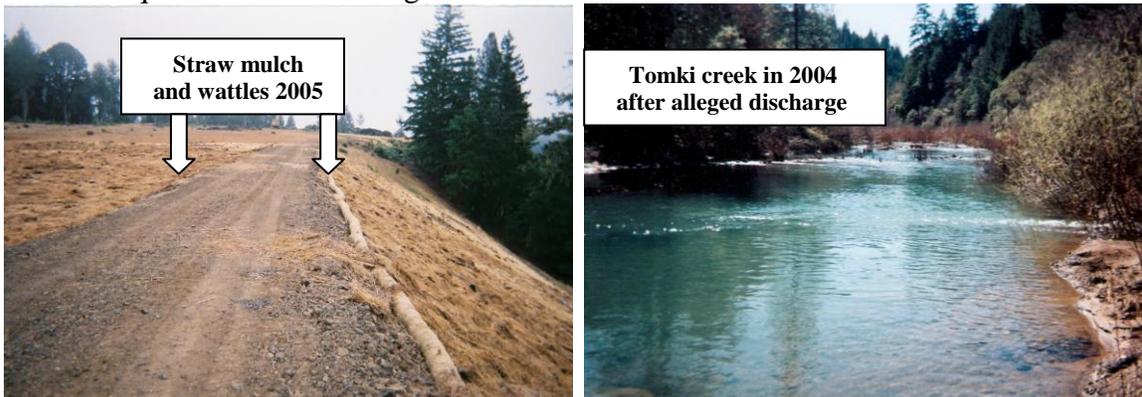
34) Yuba City, CA – Water Treatment Plant Project via EN2 Resources (2003-2006)

I prepared the aquatic resources section of a Biological Assessment and CEQA Initial Study for Yuba City's Water Treatment Plant Expansion Project. The Assessment addresses potential impacts to fisheries resources along the Feather River caused by increased water pumping. Impacts to fishery resources and appropriate mitigation measures to avoid or minimize impacts were fully addressed including intake screening and intake velocities to minimize entrainment and impingement of fish. I provided an assessment of the project's cumulative impacts of additional water diversion on the river's resources. I also served as part of a team assisting the City with federal and state permitting processes which required scheduling of construction activities and a monitoring program.



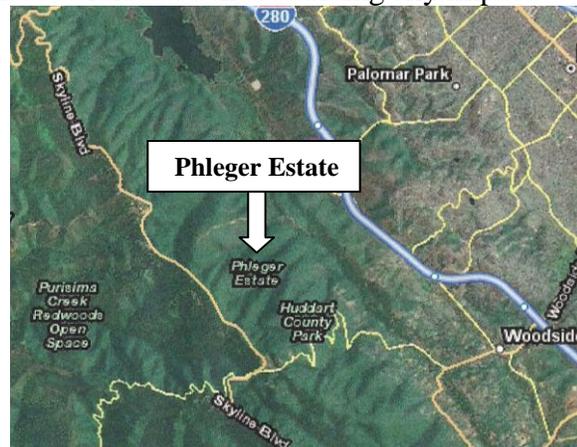
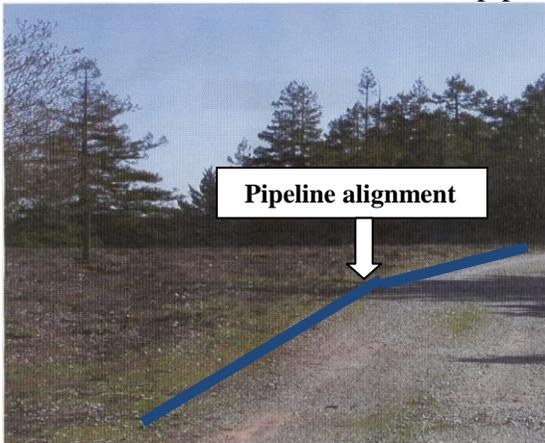
35) Willits, CA – Jon Green Contractors, Timberland Conversion (2003 - ongoing)

I undertook an environmental review of a timberland conversion in Mendocino County. In 2002 a property was cleared for agricultural use. In 2003 a Cleanup and Abatement Order was issued by the Water Quality Control Board for sediment discharges from the property to waters of the state. My analysis evaluated the potential impacts to salmonids associated with the alleged water quality violations including increased sedimentation, elevated water temperature, changes to hydrology, and nutrient loading. The data collected to date indicate that any sediment allegedly discharged in 2002 during an unseasonably stormy period has not resulted in a permanent impact to fish or creek habitat. BMPs and erosion control measures are permanently in place. I also served as an expert witness for a legal team contesting the magnitude of alleged environmental impact as a consequence of the discharge.



36) San Mateo, CA – Skyline County Water District (SCWD) - Phleger Estate Pipeline Project via Luhdorff & Scalmanini Engineers (2003 - 2005)

I prepared a CEQA Initial Study/Negative Declaration for a pipeline project at the Phleger Estate in San Mateo County. Ground water development on the property has not proved successful. To ensure a dependable supply of water to the Estate, a connection was made to the SCWD mainline approximately 0.5 miles away. Biological surveys concluded that the project would not have an adverse effect on special-status species. However, archeological review of the project site identified that part of the pipeline alignment was in close proximity to a Native American heritage site. To ensure no disturbance to cultural resources, the pipeline was relocated thus avoiding any impact.



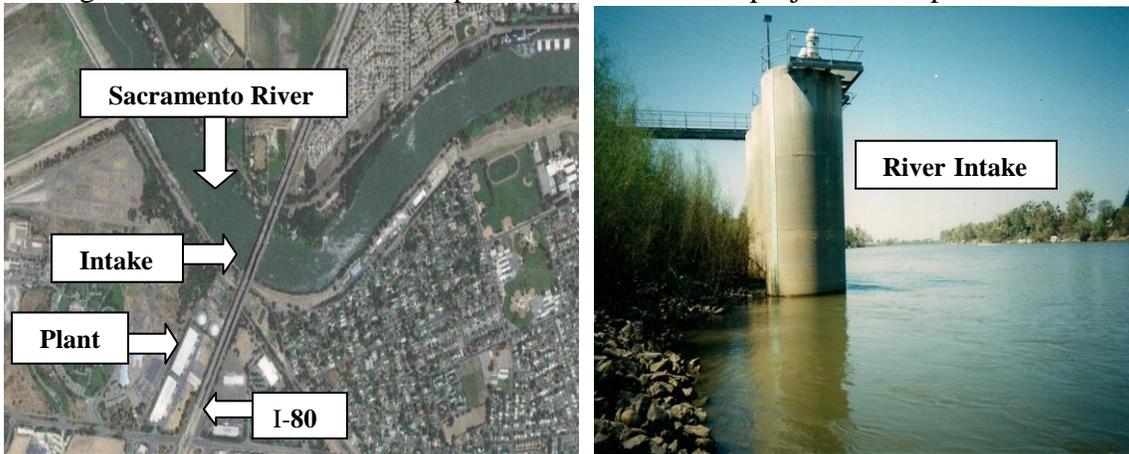
37) Sacramento County, CA – Northridge Water District (NWD), Antelope Road Pump Station via Luhdorff and Scalmanini Consulting Engineers (LSCE; 2003)

I was retained by LSCE to prepare a Streambed Alteration Agreement, CWA 401 Water Quality Certification, and CWA 404 Nationwide Permit for construction of a well water pump station and overboard pipe for discharges into an on-site excavated channel which is tributary to the Sacramento River. Six species, including the barn swallow, are found in the project area. No special-status plant or animal species were adversely affected from the project. Best Management Practices and erosion control measures ensured that no water quality degradation occurred in the excavated channel. The project is complete.



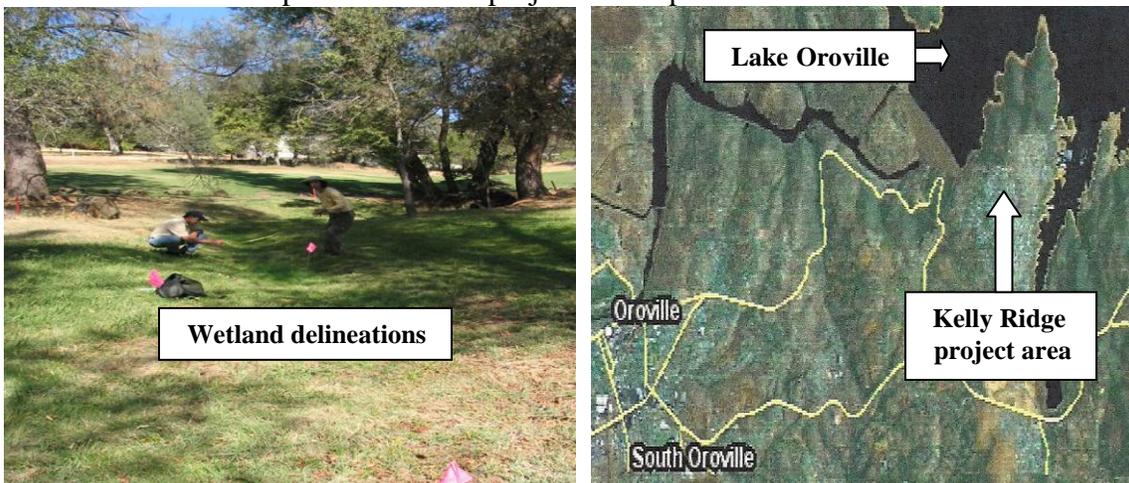
38) West Sacramento, CA – Bryte Bend Water Treatment Project (2002 - 2005)

I prepared the aquatic resources section of a Biological Assessment for CEQA/NEPA documentation as part of the City of West Sacramento’s Water Treatment Plant Expansion Project. The Assessment addresses potential impacts to fisheries and aquatic resources along the Sacramento River caused by increased water pumping. Research on intake velocities and screens to avoid impingement and entrainment of fish other aquatic organisms was paramount. The work also entailed coordination with the National Marine Fisheries Service (NMFS) and preparation of an Essential Fish Habitat assessment for endangered salmon and other fish species of concern. The project is complete.



39) Oroville, CA – Lake Oroville Area Public Utility District (LOAPUD), Kelly Ridge Sewer Improvement Project via Sauers Engineering, Inc. (2002 - 2005)

I prepared a Biological Assessment and coordinated a federal Endangered Species Act (ESA) consultation for the Kelly Ridge Sewer Improvement Project. The project is designed to reduce reliance on a series of sewer lift stations by redirecting flows from the Kelley Ridge subdivision to gravity sewer pipelines. Biologists conducted surveys to determine species that could potentially be affected by the project. Wetland delineations were required at several locations along the pipeline alignment. Appropriate mitigation measures that avoided and/or minimized impacts to any potential special-status species and wetlands were implemented. The project is complete.



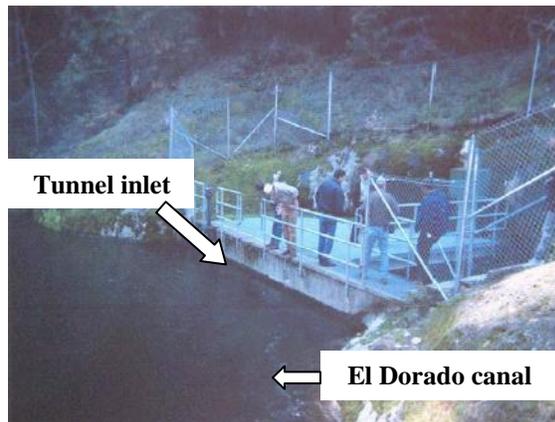
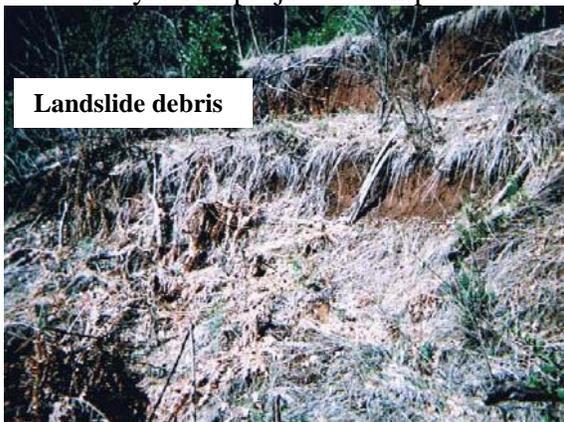
40) Placerville, CA – El Dorado Irrigation District (EID), Reservoir 12 Water Storage Improvement Project (2003 - 2008)

I prepared a CEQA Initial Study/Mitigated Negative Declaration and required environmental permitting associated with the EID Reservoir 12 Project. The purpose of the project was to enclose an existing water storage reservoir with concrete water storage tanks as required by the Department of Public Health. I identified specific mitigation measures to minimize construction impacts to the federally threatened plant, Layne's butterweed (*Senecio layneae*), surrounding the reservoir. I was responsible for monitoring a five year restoration program for this species which resulted in successful propagation of the plant. The project is complete.



41) Placerville, CA – El Dorado Irrigation District (EID), Hazel Creek Tunnel Project with Garcia and Associates (2002 - 2004)

Inland Ecosystems and Garcia and Associates prepared a CEQA Initial Study for the EID Hazel Creek Tunnel Project in El Dorado County. The document addresses the environmental impacts associated with dewatering and repair of a tunnel outlet portal which conveys emergency water from the El Dorado Canal to Jenkinson Lake in drought conditions. In January 1997 heavy rains resulted in a landslide that covered the outlet portal and damaged sections of the conveyance channel. The purpose of this project was to repair the covered outlet portal and damaged sections of the channel. The project also includes the creation of wetland habitat that provides long-term marsh cover. Other mitigation that was required included conducting pre-construction raptor and migratory nest surveys. The project is complete.



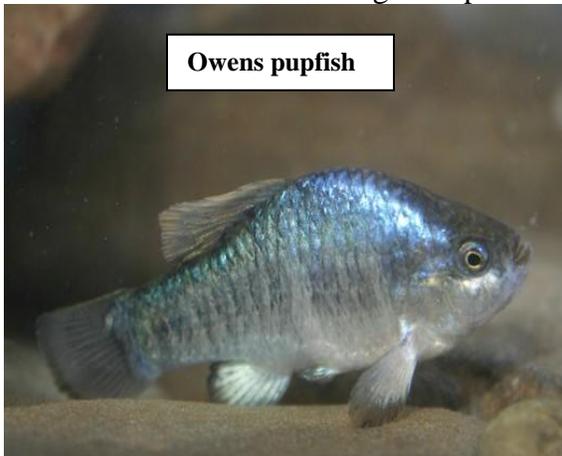
42) Mount Hermon, CA – Zayante Creek Dam Improvement Project (2003 - 2007)

I prepared a CEQA IS/MND including all environmental compliance, permitting and monitoring associated with the Zayante Creek Seasonal Dam Improvement Project. The purpose of the project was to redesign an existing concrete step-pool fishway and construct a new fish ladder at the dam site on Zayante Creek to improve passage conditions for coho salmon and steelhead trout. I worked closely with staff from the Department of Fish and Game and National Marine Fisheries Service to ensure appropriate attraction flows and other mitigation measures to facilitate fish passage.



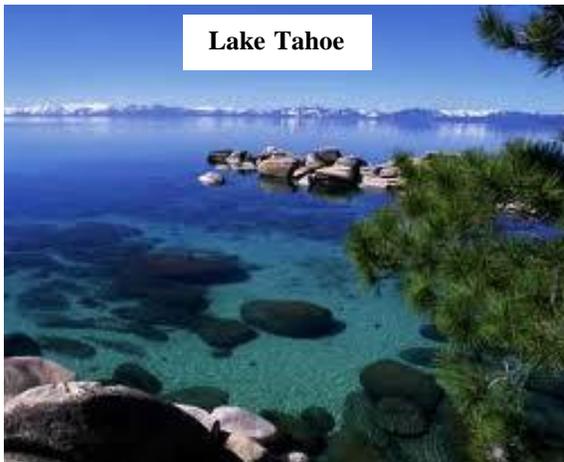
43) Bishop, CA – Inyo County Planning, Fisheries Assessment-Lower Owens River DEIS/DEIR with Garcia & Associates (2001 - 2003)

I served as Project Manager preparing an existing conditions report to establish baseline conditions on fish diversity, distribution and abundance for incorporation into the Lower Owens River Project DEIS/DEIR. This document focuses on identifying environmental impacts and mitigation measures for a proposed re-watering scheme for the lower river by allowing increased release of water from the Los Angeles aqueduct which delivers water to the LA Department of Water and Power. The project entailed fish habitat and endangered species management, water quality mitigation, and riverine restoration. The Owens pupfish (*Cyprinodon radiosus*) is restricted to the Owens Valley River and is a federal and state listed endangered species.



44) Lake Tahoe, NV – Tahoe Regional Planning Agency (TRPA), Fisheries Management Plan with Garcia and Associates (GANDA; 2001 - 2003)

I served as Project Manager for the Fisheries Thresholds and Standards update as part of TRPA’s Regional Plan update. I prepared a “Desired Future Conditions (DFC)” statement for the Lake Tahoe Basin fishery with input from state, federal and local resource agencies. The research team evaluated whether existing fisheries thresholds and standards are adequate to achieve the DFC and, where necessary, recommended additional protection measures. I also designed a benthic macroinvertebrate program aimed at establishing an Index of Biotic Integrity (IBI) for the Lake Tahoe basin. The monitoring and reporting programs are ongoing by TRPA and other stakeholder groups.



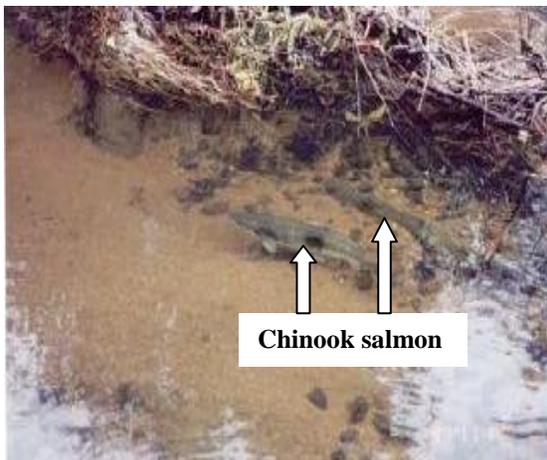
Lake Tahoe



Lake Trout

45) Roseville, CA – Department of Community Development, Mitigation Monitoring and Reporting for Salmon and Steelhead with GANDA (1999 - 2003)

I served as Project Manager over a 5-year period supervising a Mitigation Monitoring and Reporting Program as part of the City’s obligations under an ESA Section 7 consultation for the Cirby-Linda-Dry Creek Flood Control Project. The research team evaluated spawning numbers and habitat conditions for Chinook salmon and Steelhead trout using standardized visual assessment techniques, electro fishing, and seine netting. The data were used to highlight the seasonal habitat use of the creek systems for salmonids and the factors that limit their distribution and abundance.



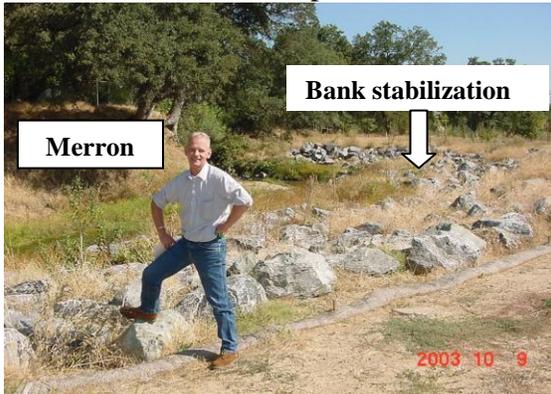
Chinook salmon



Secret Ravine

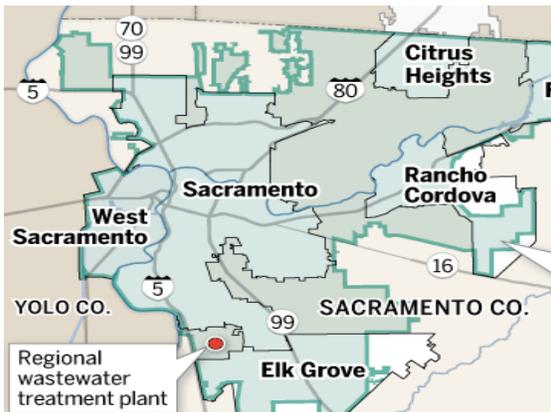
46) City of Roseville, CA – Creek and Riparian Management and Restoration Plan with GANDA (2001 - 2003)

I was a member of a multidisciplinary team preparing a Creek and Riparian Management and Restoration Plan for the City (www.roseville.ca.us/gov/community_development). The Plan addresses a wide range of environmental and management issues consistent with applicable watershed planning processes. Emphasis is on agency coordination and public outreach; GIS mapping of creek and riparian uses; protection and restoration of riparian and aquatic ecosystems; and improving wildlife habitat, water quality and watershed integrity. The result was an integrated program of City operations that balances recreation, public safety and utility needs with creek improvement guidelines for bank stabilization and riparian enhancement projects.



47) Sacramento, CA– Regional County Sanitation District with GANDA (2000-2003)

I prepared a Biological Assessment that addresses the potential impacts of the Sacramento Regional County Sanitation District Wastewater Treatment Plant Expansion Project to fisheries in the Sacramento River caused by increased effluent loading. Specifically, I addressed the potential impacts of the discharge on migrating salmonids and other fish species during periods when the river temperature is highest, the effluent temperatures are highest, and the river flows are lowest. Additionally, I evaluated other environmental stressors (e.g., dissolved oxygen levels experienced by fish in the wild) to determine whether warmer temperatures brought about by increased plant discharges could substantially contribute to synergistic effects that make behavioral and/or physiological changes more acute. My findings were used to formulate mitigation measures relative to the Sacramento River fishery and the treatment plant.



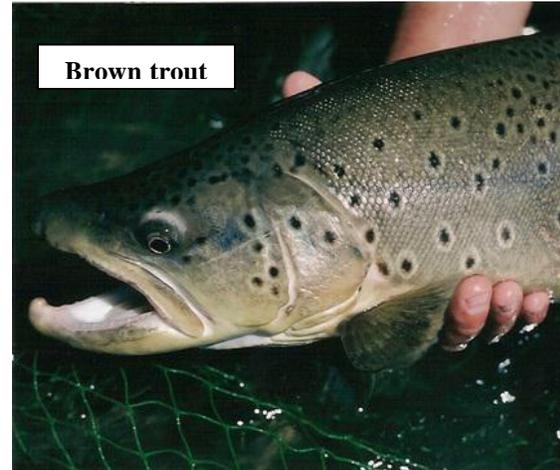
48) Mokelumne River, CA– Pacific Gas and Electric, FERC Relicensing with GANDA (1999-2002)

I served as Project Manager for Pacific Gas & Electric’s FERC North Fork Mokelumne River Hydroelectric Relicensing Project with particular emphasis on fisheries and aquatic resources. The survey team sampled fish and benthic macroinvertebrates at 27 sites in tributaries leading into and including the Mokelumne River. The project established baseline aquatic habitat conditions and instream flow management to sustain fish populations and other aquatic resources while maximizing hydroelectric production.



49) Truckee, CA – Santa Fe Pacific Pipeline Company, Donner Creek Pipeline Project via Huffman & Carpenter (1999 - 2001)

I designed a stream restoration program for Donner Creek as part of a construction project for the Santa Fe Pacific Pipeline Company. The project entailed excavating an open trench across the creek bed to bury a petroleum pipeline. This project required monitoring the fall spawning Brown trout population under a Streambed Alteration Agreement with the Department of Fish and Game. No project related impacts occurred.



50) Pyramid Lake, NV – Fisheries Director (1998 - 1999 & 2003 - 2005)

I served as Executive Director of the Pyramid Lake Fisheries (PLF) Program between 1998-1999. I was responsible for the management of fisheries restoration projects for the federally listed Lahontan cutthroat trout and cui-ui fish. The Director position involved managing a 23-person staff and a 25 million dollar federal endowment. I worked closely with state and federal agencies to find solutions to fish issues on the lower Truckee River including passage around dams; restoring riparian vegetation; tribal harvest; limnology and habitat evaluations. Between 2003-2005, I was retained by the PLF as a consultant to develop and implement a coordinated Lahontan cutthroat trout stocking program for the Truckee River with the Nevada Division of Wildlife.



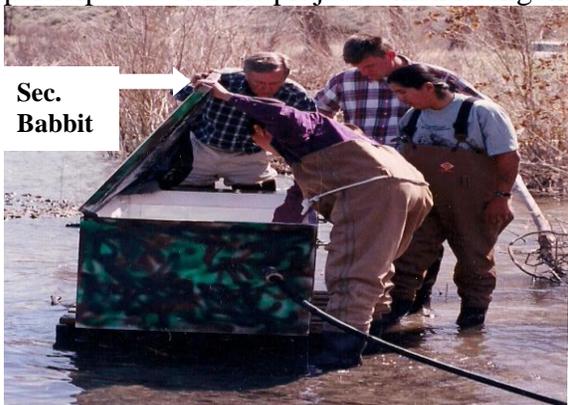
Pyramid Lake



Cutthroat trout

51) Truckee River, NV – Lahontan Cutthroat Trout Recovery Program (1998-2000)

I participated in a joint Lahontan cutthroat trout (LCT) recovery program with Trout Unlimited aimed at restoring natural recruitment of LCT in the Truckee River. The program is a low tech and highly successful method for releasing juvenile fish into the river by placing LCT eggs inside discarded old refrigerators which are modified to hold up to 50,000 eggs. These refrigerators are referred to as Stream Side Incubators (SSI's). Once the eggs hatch, the young fish move freely from the SSI's into the river and begin feeding on aquatic organisms. The goal is that these juvenile fish will follow their historic migration downstream into Pyramid Lake and grow to adults. Upon maturing, fish should migrate back into the Truckee River and spawn thus completing their natural life cycle. The former U.S. Secretary of the Interior, the Honorable Bruce Babbitt, participated with the project which is ongoing.



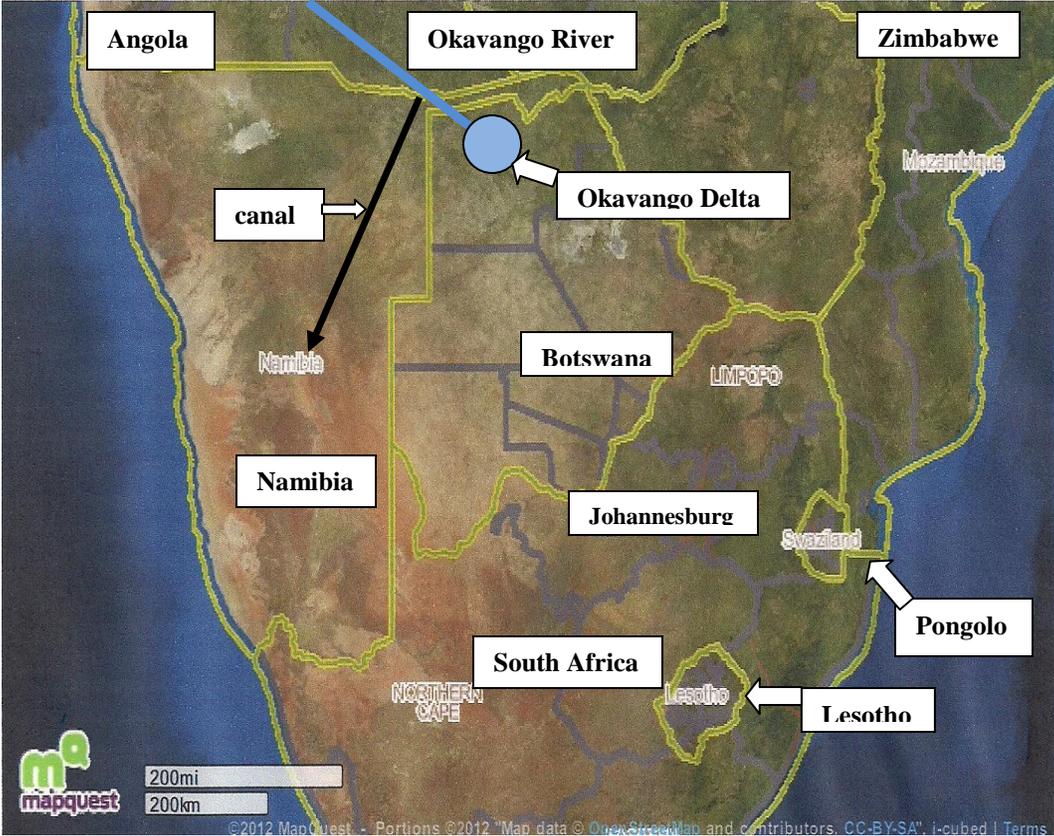
Sec.
Babbitt

STREAM SIDE INCUBATOR



DERBY DAM, TRUCKEE RIVER

SELECT PROJECT EXPERIENCE IN AFRICA



Okavango Delta



52) Okavango Delta, Botswana – Fisheries Management (1982 - 1989)

I carried out, at the invitation of the Government of Botswana, the first comprehensive fisheries assessment in the Okavango Delta. The Okavango is a vast inland “swamp” ecosystem internationally recognized as an area of high biological diversity and productivity. This project formed the basis of my Ph.D. research. I built a research station in the Okavango, along with several satellite camps throughout the delta, where field collecting of fishes and quantitative aquatic habitat assessments were carried out on a quarterly basis over a 7 year period. The goals of the research program were to identify fish distribution, abundance, biology, and ecology throughout the Okavango and the response of fishes to the annual flood cycle. This information was then used to improve the harvest of fish while maintaining the ecological integrity of the fish stocks. Several groups utilize the fisheries resource including commercial, recreational and subsistence fishermen. The research identified distinct communities of fish associated with specific habitat conditions including the magnitude and duration of the annual flood from Angola, aquatic vegetation communities, and substrate types which in turn are influenced by ecosystem “engineers” (e.g., hippopotamuses, elephants) for creation and maintenance of these habitats. Numerous scientific papers in various journals, administrative reports and popular articles resulted from this research effort which is a cornerstone for future fisheries management and conservation. The research program was funded by the World Wildlife Fund (WWF) and other conservation organizations. A book entitled “RaDitapia – Stories from the Okavango Swamps” and slide presentation are available at the Inland Ecosystems web site.

FISHERMEN



COMMERCIAL



SUBSISTENCE



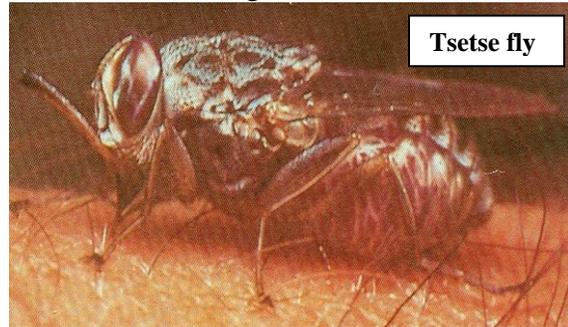
RECREATIONAL

53) Okavango Delta, Botswana – Effects of Insecticides on Fish (1989 - 1993)

I carried out, at the invitation of the Government of Botswana, a research and management program aimed at determining the environmental impacts to the aquatic community, especially fish, resulting from aerial spraying of insecticides for control of the tsetse fly. Tsetse flies transmit a deadly disease to humans and cause debilitating effects on cattle. During the 1970s and 1980s DDT and Endosulphan were the insecticides of choice to control tsetse flies. However, significant mortalities to fish and other aquatic organisms were apparent. The research program focused on identifying the optimal time of year to conduct aerial spraying operations; the best method of application; and which insecticide to apply to maximize control of tsetse flies and minimize impact to aquatic resources. Changes were made by the Chief Tsetse Control Officer, Dr. Jeff Bowles, to the timing and method of insecticide spraying, and the insecticide of choice to maximize control over the tsetse fly while minimizing effects on fish and other non-target organisms. In 1991 the Government of Botswana chose to use the insecticide Deltamethrine for the first time which has since been the insecticide of choice for aerial spraying operations. The research program was funded by the World Wildlife Fund (WWF) in Switzerland and other conservation organizations.



Spraying plane



Tsetse fly



Dr. J. Bowles, Chief Tsetse Control Officer, and Dr. G. Merron discussing the spraying program in 1989.



Collecting affected fish



G. Merron analyzing fish

54) Okavango Delta, Botswana – Dredging and Impoundment (1991 - 1992)

In 1990 a heated debate flared up over utilizing the waters of the Okavango. The project was known as the Southern Okavango Integrated Water Development Project. The project called for dredging 42 kilometers of the Boro River to enhance the flow of water into a reservoir. The people of the Okavango and the international environmental community would not accept the dredging. My role was to identify what potential environmental impacts to the aquatic community, especially fish, could result from the dredging scheme. I prepared my research findings and presented them to the WWF. My conclusion was that dredging would have a significant impact on the diversity and distribution of fishes. Botswana put the project on hold pending further environmental investigation and analysis of alternative water sources in a country comprised largely of the Kalahari Desert.

The Boro River where dredging was planned



A site where dredging took place in the 1970s



55) Okavango Delta, Botswana – Ramsar Convention (1994)

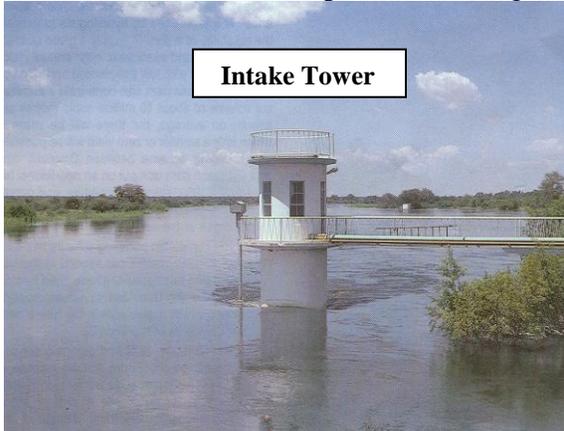
In 1994 Professor Mike Bruton and I conducted a literature based research review at the invitation of the Ramsar Secretariat to establish Guidelines for the conservation and sustainable utilization of wetlands of international importance for fish and fisheries. The results of our review were presented at the 5th Meeting of the Ramsar Contracting Parties and led to the Secretariat producing a policy on the designation of wetlands of importance to fish and fisheries. In 1997 Botswana became a contracting party to the Ramsar Convention. The Delta is the largest wetland designated under the Convention which will assist with international oversight to ensure development of the Okavango is carried out in a sustainable way.



The Okavango is a wetland of international importance. Photos taken September 1991

56) Okavango River, Namibia – Eastern National Water Carrier (1984 - 1987)

Between 1984-1987 Dr. Paul Skelton and I conducted fisheries surveys as part of an environmental impact assessment for the Eastern National Water Carrier in Namibia. The project will divert water from the Okavango River before it enters Botswana. Depending on the degree of diversion in Namibia, serious consequences for the ecological dynamics of the Okavango Delta in Botswana exists. Project engineers also designed the construction of a dam and hydroelectric facility on the Okavango River in Namibia which could also affect the Okavango Delta in Botswana. Dr. Skelton and I identified mitigation measures to minimize impacts, including the time of year to divert water from the river.



57) Maseru, Lesotho – Highlands Water Project (1994 - 1995)

In 1994 Dr. Paul Skelton and I carried out research involved with the potential environmental impacts to the aquatic fauna of constructing the Lesotho Highlands Water Project in southern Africa. The pre-impoundment survey focused on fish populations in select rivers and streams that will be permanently altered by the dam. We recommended that water bodies harboring rare native fishes be afforded the highest conservation status, while the Katse impoundment is managed for commercial harvesting including aquaculture. This research serves as a baseline to determine changes in the aquatic community as this massive water project develops. Students from the Biology Department, University of Lesotho are carrying out a long-term monitoring program.



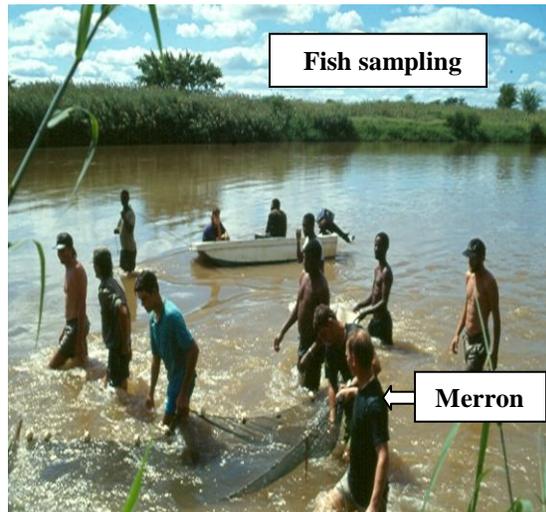
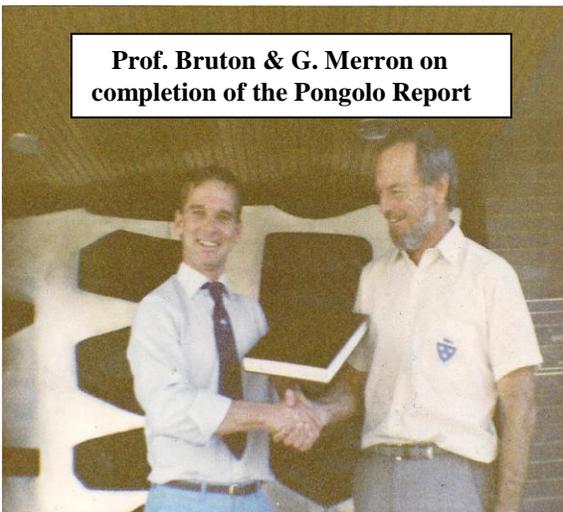
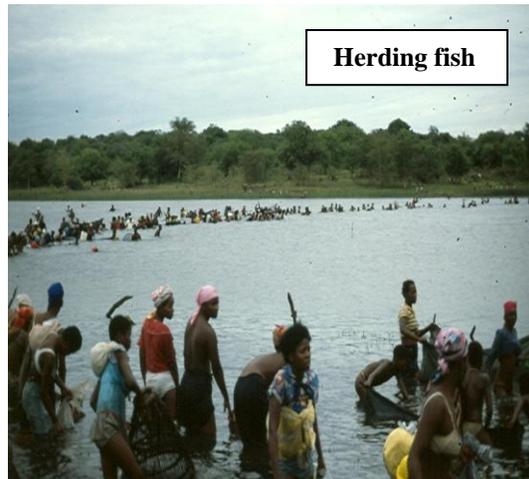
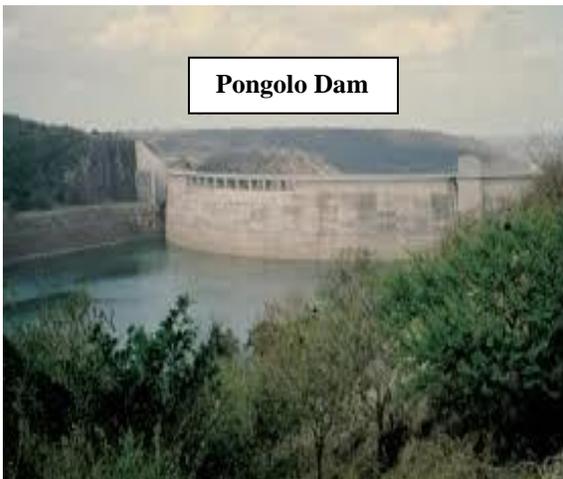
Katse Dam in April 1995



Dr. Merron assisting students from the University of Lesotho with gillnet catches, 1995

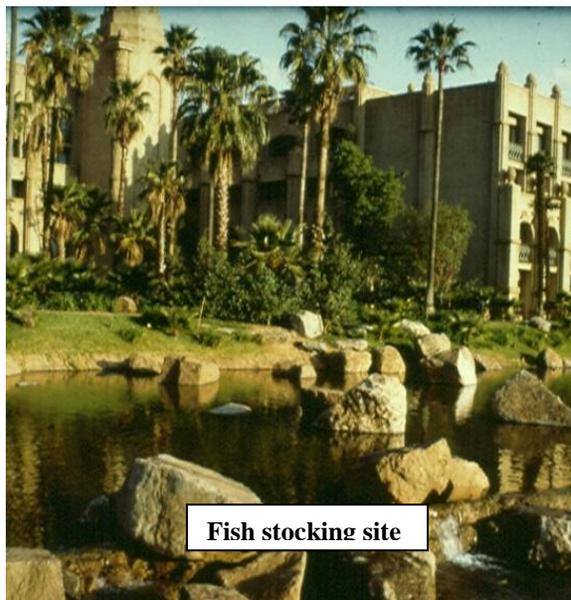
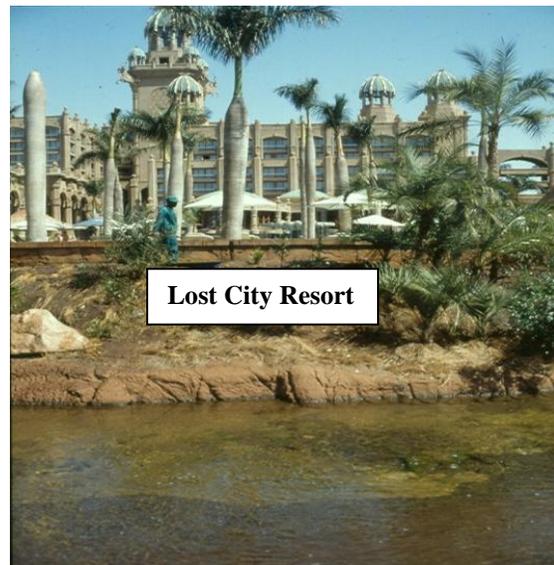
**58) Pongolo Floodplain, South Africa – KwaZulu/Natal Nature Conservancy,
Fisheries Research and Management Plan (1983-1986 & 1992-1995)**

The Pongolo floodplain is a heavily utilized subsistence area with over 100,000 people who rely on fish as a protein resource. Between 1983-1986 I served as Project Manager for an ecological program examining the changes in the community structure of the floodplain fishery before, during, and after controlled flood releases from the Pongolo Dam. The goal of the research was to identify the most appropriate time of the year to release water from the Pongolo Dam to optimize fish production in the downstream floodplain. The results of the research identified that spring and summer water releases from the dam would maximize fish production by stimulating reproduction. In the 1990's my emphasis shifted to implementing a comprehensive management plan for the floodplain. Numerous meetings were held on the floodplain with thousands of people to achieve a consensus for a spring and summer flood release from the dam that would mimic the natural floodplain hydrograph. Prior to this research program water was released from the dam during the cooler winter months when fish are physiologically inactive and not spawning resulting in less biomass available for consumption.



59) Lost City, South Africa – Fish Stocking (1992 - 1993)

The JLB Smith Institute of Ichthyology was contracted by casino magnate Mr. Sol Kerzner to stock fish throughout the hundreds of artificially created waterways that flow throughout the Lost City Resort located outside Johannesburg. I was appointed Project Manager in 1992 and successfully stocked in excess of 35,000 native fish of various species throughout this magnificent resort complex over a two-year period. The goal of transforming the biologically barren waterways into a balanced fish community continues today with fish spawning and rearing their young naturally in many of the artificial pools and backwaters.



60) Michigan Department of Natural Resources, AuSable River Fish Habitat Improvements (1979 - 1982)

I served as one of four field leaders involved with the design and construction of habitat improvement structures aimed at increasing the standing stock of trout in one of America's premier trout fishing destinations, the AuSable River. Habitat improvement structures gained much support in the 1970s after historic logging activities resulted in riverine destruction. The field crews constructed wing dams, flow deflectors, mid-stream islands, and bank erosion improvements. Over 1,000 structures were constructed during 1979-1982 and resulted in a significant increase in fish numbers and weight. I completed my Master's thesis in 1982 on the Biology of Brown Trout in the river.



Constructing fish habitat structures in the AuSable River, July 1980



G. Merron holding one of the AuSable's famed Brown trout in 1981

61) New York University at Geneseo, Laboratory Animal Technician (1975 - 1978)

While an undergraduate student at SUNY Geneseo, I was the Principal Technician for the Department of Biology, Animal Laboratory over a four-year period. My duties included the daily care of a variety of animals including mammals, birds, venomous and non-venomous reptiles, amphibians and fish. This position also involved coordinating biological research projects with undergraduate and graduate students and displaying wildlife at various venues (e.g., schools) to promote the wise use of natural resources.



Glenn Merron with Prof. Robert Roecker at the Geneseo, Animal Laboratory. Photo taken 1977.

PUBLICATIONS AND PRESENTATIONS

I have authored over 150 published or presented papers, articles and reports. My published work has appeared in major fisheries journals including *Journal of Fish Biology*, *Environmental Biology of Fishes*, *Hydrobiologia*, *Regulated Rivers: Research and Management*, *African Wildlife*, *Bioscience*, *South African Journal of Aquatic Science*, and *Botswana Notes and Records*. I have presented my research findings at numerous international conferences.

PEER REVIEWED SCIENTIFIC PAPERS

- Moyle, P.B., D.R. Purkey, K. Mosepele, G. Merron, and B. Mosepele. 2009. Fish, Floods, and Ecosystem Engineers: Aquatic Conservation in the Okavango Delta, Botswana. *Bioscience* Vol. 59: 53-64.
- Merron, G.S., and M.N. Bruton. 1995. Community ecology and conservation of the fishes of the Okavango Delta, Botswana. *Environmental Biology of Fishes* 43(2): 109-119.
- Merron, G.S., and B.Q. Mann. 1995. The reproductive and feeding biology of *Schilbe intermedius* Ruppell in the Okavango Delta, Botswana. *Hydrobiologia*. 308(2): 121-129.
- Merron, G.S. 1994. The Ecology and Utilization of the Fishes of the Wetlands of Northern Botswana, with particular reference to the Okavango Delta. Proceedings of the Conference on Wetlands, Kalahari Conservation Society, Gaborone, Botswana. 41-57.
- Merron, G.S. 1993. Pack Hunting in two species of catfish, *Clarias gariepinus* and *C. ngamensis*, in the Okavango Delta, Botswana. *Botswana Journal of Fish Biology* 43(4): 575-584.
- Merron, G.S. 1993. The Diversity, Distribution and Abundance of the Fishes in the Moremi Wildlife Reserve, Okavango Delta, Botswana. *South African Journal of Wildlife Research*. 23(4): 115-122.
- Merron, G.S. 1993. A Synopsis of Presentations and Discussions on the Fish and Fishery in the Okavango Delta, Botswana. *Botswana Notes and Records* 25: 133-140.
- Merron, G.S. 1992. Tsetse Fly Control and the Environmental Implications for Fish in the Okavango Delta, Botswana. *Botswana Notes and Records* 24: 49-56.

- Merron, G.S., M.N. Bruton, and P. la Hausse de Lalouviere. 1993. Changes in Fish Communities of the Phongolo Floodplain, Zululand (South Africa) Before, During, and After a Severe Drought. *Regulated Rivers: Research & Management*. Vol. 8: 335-344.
- Merron, G.S., M.N. Bruton, and P. la Hausse de Lalouviere. 1993. Implications of water release from the Pongolapoort Dam for the fish and fishery of the Phongolo floodplain, Zululand. *Southern African Journal of Aquatic Science* 19: 34-49.
- Merron, G.S., K.K. Holden and M.N. Bruton. 1990. The reproductive biology and early development of the African Pike (*Hepsetus odoe*) in the Okavango Delta, Botswana. *Environmental Biology of Fishes* 28: 215-235.
- Merron, G.S. 1989. A Checklist of the Fishes of the Kwando River, Selinda (Magwegqana) Spillway, Lake Liambeze and Chobe River Systems with Notes on Biology and Distribution. *Botswana Notes and Records*. Vol. 21: 135-151.
- Merron, G.S., and M.N. Bruton. 1989. Recent Fisheries Research in the Okavango Delta. *South African Journal of Science*. Vol. 85, No. 7: 416-417.
- Merron, G.S., T. Sehemo. 1987. Analysis of Fish Catches During the 1985 Chobe Fishing Competition. *Botswana Notes and Records*, Vol. 19: 91-94.
- Merron, G.S., and T. Tomasson. 1984. Age and growth of *Labeo umbratus* in Lake le Roux on the Orange River, South Africa. *Journal of the Limnological Society of Southern Africa* Vol. 10, No.1: 5-11.
- Merron, G.S. 1982. Growth rate of Brown Trout (*Salmo trutta*) in areas of the AuSable River, Michigan, before and after sewage diversion. Michigan Dept. Natural Resources, Fisheries Research Report 1900. 38pp.
- Booth, A.J., G.S. Merron, C.D. Buxton. 1995. The Growth of *Oreochromis andersonii* (Pisces: Cichlidae) from the Okavango Delta, Botswana, and a Comparison of the Scale and Otolith Methods of Ageing. *Environmental Biology of Fishes* 43(2): 171-178.
- Booth, A.J., and G.S. Merron. 1996. The age and growth of the greenhead tilapia, *Oreochromis macrochir*, from the Okavango Delta, Botswana. *Hydrobiologia* 321: 29-34.
- Knauer, J., J.R. Duncan, G.S. Merron. 1993. Sublethal Effects of an Organochloride/Synthetic Pyrethroid Insecticide Cocktail on *Tilapia rendalli rendalli* (Pisces: Cichlidae). *South African Journal of Science* Vol. 89(5): 249-251

Bruton, M.N., G.S. Merron. 1990. The Proportion of Different Eco-ethological Sections of Reproductive Guilds of Fishes in Some African Inland Waters. *Environmental Biology of Fishes* Vol. 28: 179-187.

Skelton, P.H., M.N. Bruton, G.S. Merron, and B.C.W. van der Waal. 1985. The fishes of the Okavango drainage system in Angola, South West Africa and Botswana. *Ichthyological Bulletin of the JLB Smith Institute of Ichthyology* No. 50. 21p.

PROFESSIONAL PRESENTATIONS

1995. Implications of Water Release from the Pongolapoort Dam for the Fish and Fishery of the Phongolo Floodplain, Zululand. Annual Conference of the American Society of Ichthyologists and Herpetologists. Edmonton, Canada.

1995. The Conservation of the Fishes of the Okavango Delta, Botswana – an update. Annual Conference of the American Society of Ichthyologists and Herpetologists. Edmonton, Canada.

1994. The Ecology and Conservation of the Fishes of the Okavango Delta, Botswana. Annual Conference of the American Society of Ichthyologists and Herpetologists. Los Angeles, CA.

1994. Implications of water release from the Pongolopoort Dam for the fish and fishery of the Pongolo Floodplain, Zululand, South Africa. Annual Conference of the American Society of Ichthyologists and Herpetologists. Los Angeles, CA.

1994. Annual Congress of Aquatic Scientists “Application of GIS for the management of the fishery of the Pongolo Floodplain, Zululand” (with S. Weldrick). Port Elizabeth, South Africa.

1994. Annual Congress of Aquatic Scientists. “Age and Growth of *Oreochromis andersonii* in the Okavango Delta, Botswana” (with T. Booth). Port Elizabeth, South Africa.

1994. Conference on Wetlands of Botswana. “The Ecology and Utilization of the Fishes of the Wetlands of Northern Botswana, with particular reference to the Okavango Delta”, Kalahari Conservation Society, Kasane, Botswana.

1993. Species Diversity and Relative Abundance of fish communities in the Okavango Delta, Botswana and Phongolo Floodplain, South Africa. International Conference for PARADI/ FISA "Biological diversity of African brackish and freshwater fishes", Dakar, Senegal.

1993. Establishment of Ramsar Guidelines on Wetlands of International Importance as fish habitat. 5th Meeting of the Ramsar Contracting Parties. “The Importance of Wetlands to Fish”. Kushiro, Japan. (with M.N. Bruton)
1992. Tsetse Fly Control and the Environmental Implications for Fish in the Okavango Delta, Botswana. World Wildlife Fund International, Gland, Switzerland.
1992. The Toxicological Effects to Fishes of Aerial Spraying for Control of the Tsetse Fly in the Okavango Delta, Botswana. 29th Congress of the Southern African Society of Aquatic Scientists. Cape Town.
1991. Fish and Fishery Conference - Okavango Delta, Botswana. Kalahari Conservation Society. Maun, Botswana
1988. Pack-hunting in two species of Catfish (Pisces: Clarridae) from the Okavango Delta, Botswana. Annual Conference of the American Society of Ichthyologists and Herpetologists. Ann Arbor, MI.
1988. Completion of the Okavango Fisheries Program. Kalahari Conservation Society, Gaborone, Botswana.
1988. CSIR Symposium on the Management of Invasive Aquatic Animals in Africa. “Lessons from Fish Introductions in Large Lakes”. Grahamstown, South Africa.
1988. CSIR Symposium on the Phongolo Floodplain. “Water release from the Pongolopoort Dam and the Implications for the downstream fish and fishery (with M.N. Bruton and P. laHause). Pietermaritzburg, South Africa.
1987. CSIR Symposium on Wetlands and their Conservation. The Response and Recovery of the fishes of the Pongolo Floodplain during and after severe drought. Pretoria, South Africa. (with M.N. Bruton and P. LaHause).
1987. Combined Annual Congress of the Zoological Society and Limnological Societies – Life History Styles of Fishes and other organisms. “Predator-prey interactions in the Okavango Delta, Botswana: the annual catfish run. Grahamstown, South Africa.
1986. Annual Conference, American Society of Ichthyologists and Herpetologists. Victoria, British Columbia. Vulnerability of African Fishes to man-made perturbations: a life history perspective. (with M.N. Bruton)
1986. Annual Congress of Limnological Society of Southern Africa. The effect of the annual flood cycle on fishes of the Okavango River. Windhoek, Namibia. (with P.S. Skelton)

1985. Annual Congress of Limnological Society of Southern Africa. Vulnerability of African Fishes to man-made perturbations: a life history perspective. Cape Town, South Africa. (with M.N. Bruton)
1984. Council for Scientific and Industrial Research: Symposium on Southern Hemisphere Limnology. Seasonality of Fishes in the Okavango Delta, Botswana (with M.N. Bruton and P.S. Skelton). Cape Town, South Africa.
1983. Annual Congress of Limnological Society of Southern Africa. Preliminary observations into aspects of fish biology in the upper Okavango Delta, Botswana. University of Natal, Durban.
1981. American Fisheries Society- Northwest Fisheries Division. Growth Rate of Brown Trout in areas of the AuSable River, Michigan, before and after sewage treatment. Ann Arbor, MI.

ADMINISTRATIVE REPORTS (mainly Okavango Delta and Pongolo Floodplain)

- Merron, G.S., S.K. Weldrick. 1995. Final Report: Fisheries Management of the Phongolo Floodplain. JLB Smith Institute of Ichthyology Investigational Report. No. 51: 1-129.
- Merron, G.S., S.K. Weldrick. 1995. The Seventh Fisheries Survey of the Phongolo Floodplain, South Africa. JLB Smith Institute of Ichthyology Investigational Report No. 52: 1-13.
- Merron, G.S., S.K. Weldrick, H, Kaiser, M.N. Bruton. 1994. The Sixth Fisheries Survey of the Phongolo Floodplain, South Africa. JLB Smith Institute of Ichthyology Investigational Report No. 50: 1-44.
- Merron, G.S., S.K. Weldrick, H, Kaiser, M.N. Bruton. 1994. The Fifth Fisheries Survey of the Phongolo Floodplain, South Africa. JLB Smith Institute of Ichthyology Investigational Report No. 49: 1-50.
- Merron, G.S., S.K. Weldrick, H, Kaiser, M.N. Bruton. 1994. The Fourth Fisheries Survey of the Phongolo Floodplain, South Africa. JLB Smith Institute of Ichthyology Investigational Report No. 48: 1-39.
- Merron, G.S., S.K. Weldrick, H, Kaiser, M.N. Bruton. 1994. The Third Fisheries Survey of the Phongolo Floodplain, South Africa. JLB Smith Institute of Ichthyology Investigational Report No. 47: 1-16.
- Merron, G.S., S.K. Weldrick, M.N. Bruton. 1994. The Second Fisheries Survey of the Phongolo Floodplain, South Africa. JLB Smith Institute of Ichthyology Investigational Report No. 46: 1-16.

- Merron, G.S., S.K. Weldrick, H. Kaiser, M.N. Bruton. 1994. A Fisheries Survey of the Phongolo Floodplain, Zululand, South Africa. JLB Smith Institute of Ichthyology Investigational Report No. 45: 1-59
- Merron, G.S. 1993. Fish Stocking at the Sun City/Lost City Resort Complex- Phase 2. JLB Smith Institute of Ichthyology Investigational Report. No. 43: 1-31.
- Merron, G.S. 1993. A Survey of the Fishes in and around Sun City with particular reference to Mankwe Lake (Pilanesburg National Park) and suggestions for stocking fish into the waters of the Sun City resort complex. JLB Smith Institute of Ichthyology Investigational Report. No. 44: 1-19.
- Merron, G.S., Mmopelwa, T., Besterlink, P.J., Mosajane, S., Lawson, D., Illing, J. Bolnick, S., Murray-Hudson, M., Vander Sluis, T., Sheller, P. 1992. Proceedings of a Workshop on Development and Conservation of Okavango Fishes. Maun, Botswana. 22p.
- Merron, G.S., M.N. Bruton 1992. The physiological and toxicological effects of aerial spraying with insecticides on the fish stocks of the Okavango Delta, Botswana. Final Report, World Wildlife Fund Project 3914, Gland, Switzerland. 42p.
- Merron, G.S., M.N. Bruton. 1990. The Physiological and Toxicological Effects of Aerial Spraying with Insecticides on the Fish Stocks of the Okavango Delta, Botswana. World Wildlife Fund Project 3914 - Interim Report No.5. Gland, Switzerland. 15pp.
- Merron, G.S., M.N. Bruton. 1990. The Physiological and Toxicological Effects of Aerial Spraying with Insecticides on the Fish Stocks of the Okavango Delta, Botswana. World Wildlife Fund Project 3914-Interim Report No.4. Gland, Switzerland. 34pp.
- Merron, G.S., M.N. Bruton. 1990. The Physiological and Toxicological Effects of Aerial Spraying with Insecticides on the Fish Stocks of the Okavango Delta, Botswana. World Wildlife Fund Project 3914-Interim Report No.3. Gland, Switzerland. 7pp.
- Merron, G.S., M.N. Bruton 1989. The Physiological and Toxicological Effects of Aerial Spraying with Insecticides on the Fish Stocks of the Okavango Delta, Botswana. World Wildlife Fund Project 3914 - Interim Report No.2. Gland, Switzerland. 48pp. JLB Smith Institute of Ichthyology Investigational Report. No. 31: 1-49.
- Merron, G.S., M.N. Bruton 1989. The Physiological and Toxicological Effects of Aerial Spraying with Insecticides on the Fish Stocks of the Okavango Delta, Botswana. World Wildlife Fund Project 3914-Interim Report No.1. Gland, Switzerland. 8pp.

- Merron, G.S., P. la Hausse de Lalouviere and M.N. Bruton. 1989. Implications for water release from the Pongolapoort Dam to the fish and fishery of the Pongolo Floodplain, Zululand. In: The Proceedings of a Symposium on Ecology and Conservation of Wetlands in South Africa. FRD Ecosystems Programmes Occasional Report Series (Pretoria). No. 36: 230-244.
- Merron, G.S., and M.N. Bruton. 1988. Biology and Management of the Fishes of the Okavango Delta, Botswana, with Specific Reference to the Role of the Seasonal Floods. Final Report submitted to the Government of Botswana, Ministry of Agriculture, Fisheries Division. J.L.B. Smith Institute of Ichthyology Investigational Report 29: 291 pp.
- Merron, G.S. 1988. Progress Report on the Okavango Research Program. Rhodes University Department of Ichthyology and Fisheries Science Research Report Series (Grahamstown). No. 1:1-6
- Merron, G.S., P. la Hausse de Lalouviere and M.N. Bruton. 1987. The Response and Recovery of Fish Stocks of the Pongolo Floodplain During and After a Period of Prolonged Drought. In: The Proceedings of a Symposium on Ecology and Conservation of Wetlands in South Africa. FRD Ecosystems Programmes Occasional Report Series (Pretoria). No. 28: 230-244
- Merron, G.S. 1987. Predator-prey Interaction in the Okavango Delta: The Annual Catfish Run, October-December, 1986. JLB Smith Institute of Ichthyology Investigational Report. No. 25: 1-35
- Merron, G.S. 1986. A Report on Fish Mortality after Aerial Spraying with Endosulfan Cocktail in the Okavango Delta, Botswana. JLB Smith Institute of Ichthyology Investigational Report. No. 20: 1-15
- Merron, G.S. 1986. Okavango Fisheries Research Programme 1986 Progress Report. JLB Smith Institute of Ichthyology Investigational Report. No. 22: 1-12
- Merron, G.S., M.N. Bruton. 1986. Results from Two Expeditions to the Okavango Delta, October 1985 and February 1986. JLB Smith Institute of Ichthyology Investigational Report. No. 18: 1-61
- Merron, G.S., M.N. Bruton. 1985. Progress Report for the Okavango Fisheries Research Programme for 1985. JLB Smith Institute of Ichthyology Investigational Report No. 17: 1-27
- Merron, G.S., P. la Hausse de Lalouviere, M.N. Burton. 1985. The Recovery of the Fishes of the Pongolo Floodplain after a Severe Drought. JLB Smith Institute of Ichthyology Investigational Report No. 13: 1-48

- Merron, G.S., M.N. Bruton, P.H. Skelton. 1985. Report on the October-December 1984 expedition to the Okavango Delta, Botswana. JLB Smith Institute of Ichthyology Investigational Report No. 15: 1-33
- Merron, G.S. and M.N. Bruton. 1984. Report on the June-July 1984 expedition to the Okavango Delta, Botswana. JLB Smith Institute of Ichthyology Investigational Report No. 12: 1-29
- Merron, G.S., M.N. Bruton, P.H. Skelton. 1984. Report on the March-April 1984 expedition to the Okavango Delta, Botswana. JLB Smith Institute of Ichthyology Investigational Report. No. 10: 1-27
- Merron, G.S., M.N. Bruton. 1984. Report on the October-November 1983 Expedition to the Okavango Delta, Botswana. JLB Smith Institute of Ichthyology Investigational Report. No. 8 : 1-20
- Merron, G.S., M.N. Bruton. 1984. Report on the February 1983 Expedition to the Okavango Delta, Botswana. JLB Smith Institute of Ichthyology Investigational Report. No. 5 : 1-11
- Bruton M.N., P.H. Skelton and G.S. Merron. 1984. Brief Synopsis of the main findings and objectives of the Okavango Fish Research Programme, Botswana. JLB Smith Institute of Ichthyology Investigational Report. No. 11: 9 pp
- Skelton, P.H., G.S. Merron. 1987. A Third Fish Survey of the Fishes of the Okavango River in South West Africa with Reference to the Possible Impact of the Eastern National Water Carrier. JLB Smith Institute of Ichthyology Investigational Report. No. 24: 1-21
- Skelton, P.H., G.S. Merron. 1985. A Second Fish Survey of the Fishes of the Okavango River in South West Africa with Reference to the Possible Impact of the Eastern National Water Carrier. JLB Smith Institute of Ichthyology Investigational Report. No. 14: 1-26
- Skelton, P.H., G.S. Merron. 1984. A Survey of the Fishes of the Okavango River in South West Africa with Reference to the Possible Impact of the Eastern National Water Carrier. JLB Smith Institute of Ichthyology Investigational Report. No. 9: 1-32
- Skelton, P.H., C.H. Hocutt, M.N. Bruton, G.S. Merron. 1982. JLB Smith Institute of Ichthyology and the Albany Museum 1982 Expedition to Lake Ngami, Botswana. JLB Smith Institute of Ichthyology Internal Report: 1-6
- Stallard, N.A., N.P.E. James, G.S. Merron. 1986. The Movement of Fish into and out of Mhlolo Pan During and After a Period of Controlled Flooding. JLB Smith Institute of Ichthyology Investigational Report. No. 19: 1-38
- White, P.N., G.S. Merron, R. Quick and P. la Hausse de Lalouviere. 1984. The impact of sustained drought conditions on the fishes of the Pongolo Floodplain. JLB Smith Institute of Ichthyology Investigational Report. No. 7: 1-39

SELECT CALIFORNIA ENVIRONMENTAL QUALITY ACT INITIAL STUDIES 1999 – 2011 (*mainly for Truckee Donner PUD*)

Project Manager responsible for CEQA preparation for the Northside Transmission Pipeline, Truckee, CA.

Project Manager responsible for CEQA preparation for the Prosser Dam Pipeline Project, Truckee, CA.

Project Manager responsible for CEQA preparation for the Richards Boulevard Pump Station, Truckee, CA.

Project Manager responsible for preparation of the Cedar Point Wetland Restoration Plan.

Project Manager responsible for CEQA preparation for the Sierra Meadows Pump Station, Truckee, CA.

Project Manager responsible for CEQA preparation for the Red Mountain Pump Station, Truckee, CA.

Project Manager responsible for preparation of a Wetland Delineation for the Brockway Parcel.

Project Manager responsible for preparation of the “Construction Best Management Practices & Erosion Control Manual” for Truckee Donner Public Utility District Construction Projects.

Project Manager responsible for CEQA preparation for the Donner Lake Water Storage Tank, Truckee, CA.

Project Manager responsible for preparation of a CDFG Streambed Alteration Agreement (2005-0248-R2) for the Donner Lake Water Storage Tank, Truckee, CA.

Project Manager responsible for preparation of a LRWQCB Discharge Report for the Donner Lake Water Storage Tank, Truckee, CA.

Project Manager responsible for preparation of a CDFG Streambed Alteration Agreement 2005-0151-R2 for the Donner Avenue Slipline Project, Truckee, CA.

Project Manager responsible for CEQA preparation for the Brockway Transmission Pipeline, Truckee, CA.

Project Manager responsible for CEQA preparation for the 2006 Tahoe Donner Pipeline, Truckee, CA.

Project Manager responsible for preparation of “An Assessment of Drainage and Erosion Above and Below West Reed Avenue, Truckee, CA”.

Project Manager responsible for CEQA preparation for the 2007 Tahoe Donner Pipeline Replacement Project, Truckee, CA.

Project Manager responsible for CEQA preparation for the Alder Drive Pump Station, Truckee, CA.

Project Manager responsible for CEQA preparation for the Fibreboard Well Project, Truckee, CA.

Project Manager responsible for CEQA preparation for the Pioneer Drive Conduit Project, Truckee, CA (SCH#2007052027)

Project Manager responsible for preparation of a NOI for a Low Threat Discharge for the Fibreboard Well, Truckee, CA.

Project Manager responsible for CEQA preparation for the 2008 Pipeline Replacement Project, Truckee, CA.

Project Manager responsible for CEQA preparation for the Electric Distribution Project, Truckee, CA.

POPULAR ARTICLES

Merron, G. 1994. Fishes of Moremi Game Reserve. *Marung* Vol. 12, No. 86.

Merron, G. 1993. The Ramsar Convention and the Okavango. *Marung* Vol. 11, No. 83.

Merron, G. 1993. Fish and Water Plants in the Okavango. *Marung* Vol. 11, No. 79.

Merron, G. 1993. Okavango Water – to use or not to use. *African Wildlife* 47: 222-224.

Merron, G. 1992. Conservation is the Wise Use of Natural Resources. *Marung* 10:67.

Merron, G. 1992. Tsetse Fly Control and Fishes of the Okavango. *Marung* Vol. 9.

Merron, G. 1991. Botswana Thematic Issue. *African Wildlife*. Vol. 44: 242-243.

Merron, G.S. 1990. Fishing the Fonya Way. *African Wildlife*. Vol. 45.

Merron, G.S. 1990. Okavango – A Last Word. *Tight Lines* (February).

Merron, G.S. 1990. Tsetse Fly Control and the Environmental Implications for the Okavango Delta. *African Wildlife*. Vol. 44, No. 4: 242-243

Merron, G.S. 1991. Unusual Fauna: The sharptooth catfish. *Marung*. Vol. 9.

Merron, G.S. 1990. Thamalakane- The River of Change. *Marung*. Vol. 8, No. 41: 79-81

Merron, G.S. 1989. The Okavango Swamps–A Last Word. *Tight Lines*. June 1990. 9-11.

Merron, G.S. 1989. The Annual Okavango Catfish Run. *Tight Lines*. April: 16-17

- Merron, G.S. 1989. The Annual Okavango Catfish Run. African Wildlife Vol. 43 (6)
- Merron, G.S., M.N. Bruton. 1989. The Completion of the Okavango Fisheries Program. African Wildlife. Vol. 43, No. 5: 223-225.
- Merron, G.S. 1989. Gone Fishing. Marung, Vol. 7, No. 36.
- Merron, G.S. 1989. Unusual Fauna: The Many Spined Climbing Perch. Marung, Vol. 7, No. 34: 13-15
- Merron, G.S., M.N. Bruton. 1989. The Completion of the Okavango Fisheries Program. Okavango Wildlife Society No. 9: 3-4.
- Merron, G.S. 1988. Netting Results. Marung Magazine. Vol. 6, No. 2, 9-13
- Merron, G.S. 1988. Reproduction in Fishes. Ichthos Newsletter. No. 18: 9
- Merron, G.S. 1988. Fish from the Sky. Kalahari Conservation Society Newsletter 19: 10
- Merron, G.S. 1988. Botswana's First Fish Farm. Ichthos No. 18: 15.
- Merron, G.S. 1987. Fish from the Sky. Labyrinth (36): 4-5.
- Merron, G.S. 1987. Fish from the Sky. Ichthos (14): 12.
- Merron, G.S. 1986. Feeding Specialization in Impenetrable Papyrus. Ichthos Newsletter. No. 11: 6
- Merron, G.S. 1986. Fishes of the Okavango. Orapa Bush Club.
- Merron, G.S. 1986. KCS Funds Okavango Barbel Study. Kalahari Conservation Society Newsletter. Vol. 13: 9-12.
- Merron, G.S., M.N. Bruton. 1986. Where are all the Okavango Fishes? Kalahari Conservation Society Newsletter. No. 13: 4-5
- Bruton, M.N., P.B.N. Jackson, G.S. Merron. 1987. Fish and Fisheries of Wetlands. African Wildlife. Vol. 41, No. 5: 261-263
- Bruton, M.N., G.S. Merron. 1985. The Okavango Delta- Give Credit where Credit is Due. African Wildlife. Vol. 39, No. 2: 59-63
- Bruton, M.N., G.S. Merron and R. Quick. 1985. The Okavango Delta- Southern African Paradise. Signature – Diners Club International.