

APPENDIX 8.2B

Resumes of Field Biologists

Debra Crowe

Wildlife Biologist

Education

B.S., Environmental Biology and Management (Honors), University of California, Davis
Veterinary Technician Certification Program, Western Career College, Sacramento, California

Professional Registrations

Endangered Species Act (ESA) Section 10 Scientific Take Permit for California Threatened and Endangered Fairy Shrimp and Tadpole Shrimp (Permit #TE004824-0)
California Department of Fish and Game Scientific Collector's Permit
Certified Veterinary Technician

Distinguishing Qualifications

- Experienced in California Energy Commission power plant licensing procedures
- Expert witness for biological resource evaluations on power plant projects
- Experienced in Section 7 of ESA consultations and mitigation plans
- Expertise in biological resource construction mitigation monitoring
- Routinely consults with natural resource agencies on project permitting, mitigation measures, and construction monitoring

Relevant Experience

Ms. Crowe is a wildlife and wetlands biologist who analyzes potential project impacts on biological resources, including wetlands and threatened or endangered species and Species of Concern. She has been an expert witness in several power plant licensing projects under the California Energy Commission regulations and prepared biological resource analyses, mitigation, monitoring, and resources management plans, and monitored construction and operations for compliance with Conditions of Certification. She conducts wetland delineations, biological resource surveys, timber stand exams, and wetland creation/preservation monitoring.

She has 14 years of field experience in surveys and identification of wildlife and plants, wetland delineations, field sampling, vernal pool crustacean surveys, and threatened and endangered wildlife surveys in California, Alaska, Washington, Oregon, and Nevada. Ms. Crowe is experienced in Section 7 of the ESA consultations, Biological Assessments, and mitigation negotiations, as well as in fresh and salt marsh wetland delineations using U.S. Army Corps of Engineers methods and obtaining CWA Section 404 and 401 permits, Coastal Consistency Determinations, CDFG Consultations and Streambed Alteration Agreements. Her expertise includes NEPA and CEQA regulations, procedures, and documentation production. She is certified in identification of California fairy shrimp and tadpole shrimp to species and has a current ESA Section 10 permit. Ms. Crowe is familiar with California floristics, Atlas GIS, habitat modeling, environmental law, and report preparation and is certified in Hazardous Waste

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Operations and Emergency Response. Ms. Crowe also conducts soil and water sampling on hazardous waste sites and conducts groundwater and surface water sampling programs.

She has 15 years experience in handling injured and diseased animals as a licensed Veterinary Technician and is a member of the Sacramento Wildlife Care Association.

Representative Projects

- **Application for Certification (AFC) of South Bay Replacement Project, LS Power, Inc., San Diego, California.** Task Manager for biological resource impact analysis and document section of AFC. Performed threatened and endangered species surveys, literature search, and wildlife impact evaluation for proposed electric power plant and linear features. Evaluated project demolition effects on green sea turtle artificially attracted to the warm water effluent channel, nesting Western snowy plover and California least terns in salt ponds adjacent to site, and roosting/foraging peregrine falcon, California brown pelican, and migratory birds. Permitting and consultations in progress.
- **Application for Certification (AFC) of Metcalf Energy Center, Calpine Corporation, San Jose, California.** Task Manager for biological resource impact analysis and document section of AFC. Performed threatened and endangered species surveys, literature search, and wildlife impact evaluation for proposed electric power plant, recycled water supply line, natural gas pipeline route, and electric transmission line connection. Prepared the biological resources section of the AFC and initiated consultations for sensitive biological resources with U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. National Marine Fisheries Service, California Regional Water Quality Control Board, California Department of Fish and Game, City of San Jose, Santa Clara Valley Water District, and California Energy Commission. Consulted with local experts and USFWS on potential impacts to serpentine habitat on Tulare Hill and with Santa Clara Valley Water District on potential impacts within the Fisher Creek Riparian Corridor. Prepared Management Plan for the MEC Ecological Preserve and Fisher Creek Riparian Corridor Enhancement Plan. As the CEC qualified Designated Biologist prepared and implemented a mitigation implementation and monitoring plan for sensitive biological resources during construction and operation of the project.
- **Environmental Impact Report/Environmental Impact Statement for Teayawa Energy Center, Calpine Corporation, Indio, California.** Task Manager for threatened or endangered species consultations with U.S. Fish and Wildlife Service and California Department of Fish and Game. Performed threatened and endangered species surveys, literature search, and wildlife impact evaluation for proposed electric power plant, recycled water supply line, natural gas pipeline route, and electric transmission line connection. Consulted with local experts and USFWS/CDFG on potential impacts to desert species and habitat in the Coachella Valley. Prepared the Biological Assessment and mitigation plan and initiated consultations for sensitive biological resources.

- **Application for Certification (AFC) of Sutter Power Plant, Calpine Corporation, Yuba City, California.** Task Manager for biological resource impact analysis and document section of AFC. Performed threatened and endangered species surveys, literature search, and wildlife impact evaluation for proposed electric power plant, natural gas pipeline route, and electric transmission line route. Conducted wet season and dry season surveys for listed vernal pool branchiopod species. Conducted wetland delineation, prepared wetland delineation report, biological assessment, and mitigation plans for U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, California Department of Fish and Game, and California Energy Commission. Consulted with above-mentioned agencies and the California Regional Water Quality Control Board for Clean Water Act Section 404 permit and Section 401 water quality certification to fill seasonal wetlands and construct gas pipeline through Sutter National Wildlife Refuge. Conducted stream geometry surveys and water quality analysis for irrigation canals, Sutter Bypass, and Sacramento River. As the CEC qualified Designated Biologist prepared and implemented a mitigation implementation and monitoring plan for sensitive biological resources during construction and operation of the project.
- **Application for Certification (AFC) of Delta Energy Center, Calpine Corporation, Pittsburg, California.** Task Manager for biological resource impact analysis and document section of AFC. Performed threatened and endangered species surveys, literature search, and wildlife impact evaluation for proposed electric power plant, natural gas pipeline route, and electric transmission line route. Conducted wet season and dry season surveys for listed vernal pool branchiopod species. Currently preparing wetland delineation report, biological assessment, and mitigation plans for U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, U.S. National Marine Fisheries Service, California Department of Fish and Game, and California Energy Commission. Consulted with above-mentioned agencies and the California Regional Water Quality Control Board for Clean Water Act Section 404 permit, Section 10 Rivers and Harbors Act, and Section 401 water quality certification to construct in areas of coastal wetlands with special-status species such as California clapper rail, salt-marsh harvest mouse, species occurring within the Antioch Dunes National Wildlife Refuge. As the CEC qualified Designated Biologist prepared and implemented a mitigation implementation and monitoring plan for sensitive biological resources during construction and operation of the project.
- **Expert Testimony of Cosumnes Power Plant, Sacramento Municipal Utility District (SMUD), Sacramento, California.** Prepared expert testimony for portions of biological resource impact analysis and agency consultations. Performed threatened and endangered species surveys, including Swainson's hawk and Western burrowing owl. Consulted with USFWS and CDFG on potential impacts to federal and state listed species. Prepared Biological Resources Mitigation Implementation and Monitoring Plan for sensitive biological resources during construction and operation of the project.

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- **Threatened and Endangered Species Surveys for New Electric Transmission Line Corridors; Sacramento Municipal Utility District (SMUD), Sacramento County, California.** Assisted in threatened and endangered species surveys of new utility corridors in Sacramento County. Located occurrences of state protected species including Swainson's hawks, burrowing owls and vernal pool crustaceans.
- **Application for Small Power Plant Exemption for Carson Ice-Cogeneration Facility, Sacramento Regional Wastewater Treatment Plant, Carson Energy Group, Elk Grove, California.** Assisted in the preparation of a Biological Resources Management Plan for the burrowing owl and threatened or endangered species at the project site. Served as assistant project manager for biological resource construction mitigation monitoring in vicinity of project site. Conducted surveys for threatened and endangered species, Species of Special Concern, and wetlands and other wildlife habitats. Researched alternative structures for burrowing owl burrows. Assisted in the development of a Biological Resources Sensitivity Awareness Training Program and brochure for site managers. The training class covered species identification (giant garter snake, Swainson's hawk, burrowing owl), habitat management, and the nature of, and compliance with, existing state and federal environmental laws. Assisted in teaching the sensitivity program. Prepared the 1994 Burrowing Owl Monitoring Report for submission to the California Energy Commission. Attended agency meetings and consulted with client on agency matters.
- **Application for Certification (AFC) of Sacramento Ethanol and Power Cogeneration (SEPCO) Project, Ark Energy Group, Rio Linda, California.** Performed threatened and endangered species surveys (giant garter snake, fairy shrimp, Swainson's hawk, burrowing owls), literature search, and wildlife impact evaluation for proposed ethanol production plant and water pipeline route. Assisted in vernal pool crustacean surveys on project site. Conducted wetland and raptor surveys for evaluation of impacts along proposed water pipeline route.
- **Threatened and Endangered Species Surveys for Seismic Upgrade of Mokelumne Aqueduct No. 3, East Bay Municipal Utility District, San Joaquin County, California.** Conducted surveys for special-status species along the aqueduct pipelines. Prepared a technical biological assessment for consultations with the California Department of Fish and Game, U.S. Fish and Wildlife Service, and U.S. Army Corps of Engineers. Developed mitigation measures to protect delta smelt, chinook salmon, Central Valley steelhead, Sacramento splittail, and nesting Swainson's hawks and burrowing owls along the aqueduct during construction.
- **Wildlife Surveys for Piñon Pine Power Project; Sierra Pacific Power Company, Nevada.** Assisted in research of threatened and endangered species present in project vicinity. Conducted threatened and endangered wildlife surveys. Conducted small mammal trapping and identification for habitat evaluation.

- **Threatened and Endangered Species Wildlife Surveys for Proctor and Gamble Cogeneration Project; Sacramento Municipal Utility District, Sacramento, California.** Performed threatened and endangered species wildlife surveys for burrowing owls, raptors, and vernal pool crustaceans along the proposed fiber optic lines route from the Proctor and Gamble cogeneration plant site. Identified wetlands and sensitive species habitat.
- **Biological Assessment and Vernal Pool Crustacean Surveys for B.T. Collins Army Reserve Training Center, U.S. Army Reserve Command, Sacramento, California.** Conducted threatened and endangered species surveys and prepared a biological assessment for the project area. Responsible for organization and conducting vernal pool crustacean surveys and identifications under a Section 10 Scientific Take Permit (#796012) and U.S. Fish and Wildlife Service Vernal Pool Crustacean Survey Guidelines. Collected voucher specimens and identified them to species. Responsible for submission of annual report to U.S. Fish and Wildlife Service and voucher specimens to California Academy of Sciences. Consulted with U.S. Fish and Wildlife Service to develop and implement a mitigation plan for seasonal wetlands, vernal pool fairy shrimp, and burrowing owls. Conducted burrowing owl mitigation monitoring and reports.
- **Low-Effect Habitat Conservation Plan for Tulare Irrigation District Main Intake Canal Lining Project, Visalia, California.** Performed San Joaquin kit fox surveys using camera stations and walking transects under the USFWS survey protocols. Prepared technical memorandum for submittal to USFWS. Assisted in preparation of Low-effect habitat conservation plan for Valley elderberry longhorn beetle in project area.
- **Biota Collection for Kesterson Reservoir, Bureau of Land Management, Gustine, California.** Collected blood samples from American kestrels and loggerhead shrike for selenium evaluation. Collected aquatic insects for selenium analysis from ponding areas. Conducted avian surveys and telemetry field work on kestrels at the site.
- **Forest Stand Exams; USDA Forest Service, Deschutes National Forest; Oregon.** Served as field co-manager for conducting intensive forest stand exams on 55,000 acres of the Deschutes National Forest. Responsible for data management and quality control of more than 12,000 individual sample points, including forest measurements, forest disease evaluation, habitat evaluation, and sensitive plant and wildlife surveys. Coordinated the organization of 20 crew members (including subcontractors) for field data collection and onsite daily planning. Coordinated biweekly with the U.S. Forest Service for submittal and quality control of all computerized data and data sheets.
- **Environmental Impact Statement/Report for Headwaters Forest Agreement, Pacific Lumber Company, Humboldt County, California.** Analyzed and categorized more than 10,000 pre-EIS/EIR scoping comments for Headwater Agreement between Pacific Lumber Company, U. S. Fish and Wildlife Service, and California Department of Fish and Game. Assisted in development of a scoping report to address community concerns that would be included in the Environmental Impact Statement.

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- **Evaluation of Second-Growth Forest Treatments for Wildlife; USDA Forest Service, Clearwater Valley in Gifford Pinchot National Forest, Washington.** Associate scientist for conducting research to determine the effects of various silviculture modification of second-growth forest on wildlife. Field work included; data collection for tree growth parameters, setting up research grids, and conducting wildlife observations.
- **Environmental Impact Statement and Biological Assessment for Sacramento Army Depot Disposal and Reuse, Sacramento, California.** Conducted surveys for threatened and endangered species and Species of Special Concern (including burrowing owls, fairy shrimp, and tadpole shrimp). Prepared the Biological Assessment for vernal pool fairy shrimp on the Sacramento Army Depot for the U.S. Fish and Wildlife Service. Consulted with U.S. Fish and Wildlife Service and developed vernal pool fairy shrimp mitigation measures for closure and reuse of the Depot. Prepared a wetland delineation report for vernal pools in Open Space areas. Conducted an extensive vernal pool fairy shrimp and tadpole shrimp literature search.
- **Biological Assessment for Oakland Army Base, Oakland California.** Conducted threatened and endangered plant and animal species surveys on the project site including submerged land within the San Francisco Bay. Consulted with U.S. Army Corps of Engineers, U.S. National Marine Fisheries Service, and U. S. Fish and Wildlife Service for potential project impacts. Prepared sections of the Environmental Assessment and Environmental Impact Statement for the project.
- **Environmental Baseline Survey for McClellan Air Force Base, Sacramento, California.** Conducted Phase I, II and III Visual Site Inspections of buildings and open land areas for evidence of hazardous material releases and potential pathways for contamination. These surveys were used to determine DOD categorization of land parcels and possible privatization reuse opportunities under the Base Realignment and Closure process. Conducted wildlife and sensitive habitat surveys on all property sites. Assisted in production of Basewide and Site-specific Environmental Baseline Survey documents.
- **Environmental Baseline Survey for Oakland Army Base, Oakland California.** Conducted Visual Site Inspections of buildings and land areas evidence of hazardous material releases and potential pathways for contamination. These surveys were used to determine DoD categorization and possible reuse under the Base Realignment and Closure process. Conducted wildlife surveys in open areas. Consulted with California Department of Fish and Game and the U.S. Army Corps of Engineers on special status species and wetlands. Assisted in Basewide Environmental Baseline Survey document preparation.
- **Habitat Evaluation Procedures (HEP) Study and Sensitive Species Surveys for Ramsey-French Meadow Hydroelectric Project, Northern California Power Agency, Upper Stanislaus River, California.** Assisted in timber map and aerial photograph evaluation, habitat typing, planimetry, field surveys, and ground-truthing of delineated habitat polygons, along with data compilation. Assisted in spotted owl and northern goshawk surveys and data compilation. Mapped mule deer migration routes, and summer, winter,

and fawning habitats along proposed transmission line. Mapped sensitive wildlife species sightings along proposed transmission line.

- **Ecological Risk Assessment for Jet Propulsion Laboratory, Pasadena, California.** Responsible for biological resource inventory on Jet Propulsion Laboratory and neighboring Arroyo Seco. Conducted threatened and endangered species surveys. Evaluated habitat types and the potential for sensitive receptor species to occupy the site.
- **Environmental Impact Statement for Swan Lake-Lake Tyee Intertie Project, Ketchikan Pulp Company, Ketchikan, Alaska.** Responsible for identification of wetlands, floodplains, riparian habitat, threatened and endangered species locations, potential mass movement areas, and stream classifications along proposed transmission line route. Also responsible for data analysis and preparation of EIS sections.
- **Control Lake Environmental Impact Statement for U.S. Forest Service, Klawok, Alaska.** Assisted in laying out timber sale plots on Prince of Wales Island. Responsible for locating and plotting class I, II, and III streams using compass, aerials, and topo maps. Recorded wildlife species, plant species, and habitat types on Prince of Wales Island. Assisted in bald eagle, northern goshawk, marbled murrelet, and other wildlife surveys with assistance of a helicopter. Comfortable with helicopter flight.
- **Subcontractor for Threatened and Endangered Fairy Shrimp and Tadpole Shrimp Species, Simpson Environmental, San Joaquin, Calaveras, Tuolumne, and Solano counties, California.** Project manager and field technician for vernal pool crustacean surveys on project sites requiring agency consultation. Responsible for organization and conducting vernal pool crustacean surveys under a Section 10 Scientific Take Permit and US Fish and Wildlife Service Vernal Pool Crustacean Survey Guidelines.
- **Water Quality Monitoring of Morrison Creek; Sacramento Municipal Utility District.** Performed water quality analysis for monitoring along Morrison Creek at various sites below the Proctor and Gamble cogeneration plant. Conducted monitoring from the area immediately below the site to 10 miles downstream.
- **Mono Lake Basin/Upper Owens River Investigation; California Department of Fish and Game.** Assisted in planimetry and evaluating for eastern Sierra Nevada stream channel gains and losses. Compiled data and assisted in report preparation. Photographed stream flow for streams entering Mono Lake.
- **Fish Population Monitoring for Oroville-Wyandotte Irrigation District, California.** Responsible for preparation of field equipment and crew for electrofishing in several streams. Used electrofishing field methods to collect, measure, and weigh fish. Recorded data and composed graphics for documentation.

Richard Crowe

Senior Environmental Technician/CH2M HILL

Education

B.S. – Wildlife Biology/Forestry in progress

Professional Registrations

Endangered Species Act Section 10 Scientific Take Permit for Vernal Pool Invertebrates
California Department of Fish and Game Scientific Collector's Permit

Distinguishing Qualifications

- Over eleven years experience working in Central Valley ecosystems
- Extensive experience in conducting pre-construction surveys and construction monitoring
- Extensive experienced with monitoring horizontal directional drilling projects, monitored 51 horizontal directional drills to date
- Experienced and trained wetland delineator
- Experienced with vernal pool invertebrates
- Recognized by the California Department of Fish and Game as qualified to conduct surveys for sensitive raptors throughout San Joaquin and Sacramento counties
- Experienced with NEPA and CEQA guidelines
- Experienced with preparing a variety of environmental permits and documents

Relevant Experience

Mr. Crowe is an experienced field biologist with eleven years of experience including specific expertise with special-status species surveys, wetland delineations, permitting, and construction management in the Central Valley. He is experienced in working within NEPA and CEQA guidelines and have conducted technical studies in support of several EIR, NES, Initial Studies, and other environmental documents.

Representative Projects

- **Roseville Electric, Roseville Electric Park, Roseville CA.** Biological monitor for ongoing construction of a 125 mega-watt power plant. Conducted all forms of biological monitoring on power plant and associated linear facilities. Storm Water Pollution Prevention Plan inspector for City of Roseville on Roseville Electric Park project.
- **ARB, Inc., Concord to Sacramento Pipeline Project.** Environmental Coordinator on 71-mile 20-inch petroleum products pipeline between Concord and Sacramento, California. Biologist responsible for environmental compliance and multi-agency liaison.

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- **Roseville Electric, Reason Farms North Parcel, Placer County, CA.** Conducted Jurisdictional Wetlands and Waters of the U.S. on 116 acre proposed mitigation parcel for future Roseville Energy Park.
- **Calpine Natural Gas Company, Rio Vista Pipeline Project.** Biologist responsible for permitting, wetland delineating, threatened and endangered species surveys, biological monitoring, consultation with Fish and Wildlife Service and agency liaison. Project consisted of 11.5 mile 12" natural gas pipeline with an associated 1-mile horizontal directional drill beneath the Sacramento River.
- **Merced Irrigation District Foster Farms Transmission Line Project Supplemental EIR.** Conducted biological studies for 25-mile transmission line in Stanislaus and Merced counties. Conducted wetland delineation using the ACOE 1987 methodology, mapped potential fairy shrimp habitat, and conducted site reconnaissance of potential substation and river crossing locations.
- **Wetland Delineation, Red Beach Training Area, Camp Pendleton, CA.** Conducted wetland delineation on 1,122 acres of assorted plant communities within Camp Pendleton Marine Corps Base.
- **Calpine Corporation, Sutter Energy Center, Sutter County.** Conducted 5 year Avian Collision Study on new Western Area Power Administration transmission lines from Sutter Energy Center to O'Banion Substation.
- **Modesto Irrigation District Utilities Project.** Biologist responsible for construction monitoring and supervising crews during construction for protection of potential valley elderberry longhorn beetle habitat during transmission line upgrades and new substations in the vicinity of Ripon and Riverbank.
- **Calpine Sutter Power Plant Project.** Field assistant for habitat mapping of Swainson's hawk, giant garter snake, and vernal pool fairy shrimp to determine potential construction impacts and the need for possible pre-construction surveys and monitoring during construction. Also assisted with wet-season vernal pool invertebrate sampling using USFWS approved protocols.
- **SMUD, Consumnes Power Plant Project, Sacramento County.** Conducted giant garter snake, burrowing owl, Valley Elderberry Lognhorn Beetle surveys and consultation with Fish and Wildlife Service. Assisted with cultural studies on 26 +/- mile natural gas pipeline, studies included pedestrian transects, use of ground penetrating radar on selected areas, and sifting soil in 1-meter square points along right-of-way.
- **Obsidian Butte Pipeline Project, Salton Sea.** Assisted with archeological pedestrian surveys for the Obsidian Butte pipeline project at the Salton Sea.
- **Calpine Corporation, Calpine Natural Gas Company, Sacramento and Solano Counties.** On-call biologists for Calpine Natural Gas Company, duties include; Fish and Game, Army Corps permitting. And construction monitoring during construction.

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- **Calpine Corporation, Delta Energy Center, Contra Costa County.** Biological monitor for ongoing construction of a 880 mega-watt power plant. Conducted all forms of biological monitoring on power plant and associated linear facilities. Key contact with California Department of Fish and Game Wardens during all facets of construction.
- **1700-acre wetland delineation for the Army Corps of Engineers, Chico, California.** Conducted wetland delineation on Rock Creek-Keefer Slough Flood Control Project.
- **Shotgun Creek Estates EIR.** Field assistant for biological studies in support of EIR on proposed 1,600-acre residential subdivision in the Tuolumne County foothills. Assisted with 1994-95 USFWS protocol vernal pool invertebrate surveys in a 250-acre portion of the project site.
- **Camanche Greens EIR.** Field technician for studies in support of Environmental Impact Report Biology Chapter for a proposed 514-acre residential and golf course subdivision in western Amador County. Assisted in wetland delineation using the ACOE 1987 methodology and conducted elderberry shrub inventory and inspection for the federally threatened valley elderberry longhorn beetle according to USFWS 1994 guidelines.
- **Army Corps of Engineers Phase 111 Levee Repairs at 284 individual work sites in San Joaquin and Stanislaus Counties.** Developed and implemented a worker environmental awareness program. Conducted pre-construction surveys and photodocumentation, focused at ensuring contractor compliance with Endangered Species Act, Clean Water Act and Corps of Engineers Section 01130 environmental protection programs. Conducted photodocumentation of post-construction conditions at established photo-stations, and compiled all of the above documentation for submittal to the Corps.
- **Army Corps of Engineers Phase 111 Levee Repairs at 166 individual work sites in Sacramento, Solano, and Yolo Counties.** Developed and implemented a worker environmental awareness program, with emphasis on identification of giant garter snake and its habitat. Conducted pre-construction surveys and photodocumentation, focused at ensuring contractor compliance with Endangered Species Act, Clean Water Act and Corps of Engineers Section 01130 environmental protection programs. Participated in field meetings at individual work sites with responsible agencies and their contractors to identify environmentally superior construction methods. Conducted photodocumentation of post-construction conditions at established photo-stations, and compiled all of the above documentation for submittal to the Corps.
- **San Joaquin County Department of Public Works Roads and Bridges.** Principal field biologist for all of San Joaquin Counties road maintenance projects, flood damaged road projects, flood damaged bridge projects and seismic retrofit projects. Duties include biological assessments of each site, Natural Environment Studies (NES) for federally funded sites and conducting database searches, evaluating biological resource impacts, developing mitigation measures as needed, and ensuring compliance with the Endangered Species Act and Clean Water Act on rapid turn-around public works projects.

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- **Weston Ranch Bridge Project.** Conducted intensive construction monitoring of an active Swainson's hawk nest for eight weeks during pile driving associated with construction of a new bridge. Documented hawk activity, monitored noise levels, and recorded construction activities. Upon completion, assisted in the preparation of a comprehensive monitoring report that was submitted to CDFG. Currently monitoring revegetation activities at the old bridge site as a requirement of the CDFG Streambed Alteration Agreement.
- **Central Valley Agriculture Facilitation.** Conducted wetland determinations and formal wetland delineation's for numerous farmers in Merced, Stanislaus, San Joaquin, and Contra Costa counties; most of the projects involved conversion of grazing land to orchards and vineyards. The studies were conducted pursuant to both USDA Farm Bill and the Clean Water Act.
- **Kirkwood Ski Resort Biological Studies.** Field assistant for biological studies for over 300 acres zoned for future land development activities in the Kirkwood community. Conducted wetland delineation using the ACOE 1987 methodology, processed field data, and prepared report for submittal to the ACOE. Conducted mountain yellow-legged frog surveys in all major waterways within the 300 acres project site.
- **Sutter Gold Venture Lincoln Project Access Road.** Conducted inspection for the federally-threatened valley elderberry longhorn beetle or evidence of past inhabitation on an elderberry shrub located within the construction zone for a proposed access road to a gold processing plant.
- **Evaluation of Second-Growth Forest Treatments for Wildlife; USDA Forest Service, Clearwater Valley in Gifford Pinchot National Forest, WA.** Field technician for conducting research to determine the effects of various silviculture modifications of second growth forest on wildlife. Fieldwork included, data collection for tree growth parameters, setting up and laying out research grids, and conducting wildlife observations.
- **Forest Stand Exams; USDA Forest Service, Deschutes National Forest; Oregon.** Field crew leader for conducting intensive forest stand exams on 55,000 acres of the Deschutes National Forest. Responsible for data management and quality control of over 12,000 individual sample points, including forest measurements, forest disease evaluation, habitat evaluation, and sensitive plant and wildlife surveys. Assisted in coordination and organization of 20 crew members, including subcontractors, for field data collection and on-site daily planning.
- **Natural Resource Inventory for North Stockton Projects, CA.** Field technician for biological studies in support of Environmental Impact Report for proposed 800-acre residential development in north Stockton. Assisted with 1994-95 USFWS protocol vernal pool invertebrate surveys in a 40-acre portion of the project site.
- **Calaveras Springs Special Plan Project Vernal Pool Invertebrates Surveys.** Field assistant for biological studies for 150-acre commercial, industrial, and residential development

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project in Calaveras County. Conducted USFWS protocol vernal pool invertebrate surveys and assisted with field verification of previously delineated wetlands.

- **Ringtail Population Monitoring Project.** Student research assistant for ringtail populations studies in Brockman Canyon, South Sutter Buttes, CA. Assisted with trapping, measuring, and tagging ringtails.
- **California Department of Transportation Beach Lake Mitigation Bank.** Field assistant for full protocol giant garter snake surveys of Morrison Creek for I-5 overpass widening, construction of giant garter snake hibernacula, and installation and monitoring of artificial burrows for burrowing owls.

Specialized Training

- Wetland Delineation, Richard Chinn Environmental Training, Inc., 1998
- Fairy Shrimp Identification, Dr. Denton Belk, 1998
- OSHA, 40-hour Hazardous Materials Training, Network Environmental Systems
- First Aid and CPR Training, American Red Cross
- 10-Hour Construction Safety Awareness Training CH2M HILL
- Site Safety Coordinator Training, CH2M HILL
- Hydric Soils Workshop, Dr. J. Herbert Huddleston, Oregon State University

Memberships in Professional Organizations

- Burrowing Owl Consortium
- California Inland Invertebrate Working Group
- National Audubon Society
- Ducks Unlimited
- Stone Lakes National Wildlife Refuge Association
- Bat Conservation International
- California Waterfowl Association
- California Native Grass Association

Virginia Dains
Biological Resource Consulting
3371 Ayres Holmes Road, Auburn CA 95603
530-888-9180 / 888-9022 fax / geobot@jps.net

- ◆ Vegetation mapping
- ◆ Interpretation of soils and geologic mapping and aerial photography
- ◆ Botanical surveys
- ◆ Ecological research
- ◆ Wetland delineation

Education

M.S., Biology (Plant Ecology), 1992, California State University, Sacramento, Thesis Topic: "The Water Relations of *Alnus rhombifolia*"

B.S., Biology (Field Biology), 1978, California Polytechnic State University, San Luis Obispo

Relevant Experience

Biological CONSULTING contracts since 1979 include:

- **Special-status plant surveys** in California and western Nevada. Projects were conducted for state, federal, or private concerns and include GPS field mapping, mitigation measures, and conservation guidelines.
- **Riparian vegetation mapping, quantitative sampling, and interpretation** in relation to streamflow reductions in the Sierra Nevada for Pacific Gas & Electric and Southern California Edison, including research on physiological responses of key riparian shrubs and trees. Research report on riparian vegetation response to reduced streamflow on Putah Creek, Yolo County. **Expert witness** on riparian vegetation along the lower American River, Sacramento County before the State Water Resources Control Board staff; **Impact assessment** for Calabasas Creek Flood Control Project, Santa Clara County; **Riparian Revegetation** planting and monitoring guidelines for Placer County.
- **Wetland Management Plans** for County of Sacramento, Environmental Planning. **Wetland delineations** in riparian, seasonal wetland, vernal pools, alkaline, mountain meadow, seeps and discharge wetland habitats in California and Nevada. **Wetland delineation training** assistant for U.S. Army Corps of Engineers training classes, **Wetland Plant Identification Instructor** for EPA and US Fish and Wildlife Service. **Wetland mitigation** design and implementation including construction monitoring, and construction of experimental vernal pools. **ARCView GIS** mapping and interpretation.
- **Other Experience:** Forage Inventory for BLM and Nevada Cattleman's Association, Workshop leader on Vernal Pools, Backcountry Naturalist for The Nature Conservancy wilderness tours; Mt. St. Helens vegetation recovery researcher.

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Project Details

1980. Vegetation mapping of Desolation and Mokelumne Wilderness Areas. El Dorado National Forest project for WESCO, San Rafael, CA.
1983. Evaluation of Riparian Vegetation at Existing and Proposed Diversion in the Western Sierra Nevada, transect sampling to assess effects of water diversion for small hydroelectric projects. Nevada County to Fresno County western Sierra Nevada streams. P.G. & E. project for Jones and Stokes Associates, Inc., Sacramento, CA.
1983. Field Reconnaissance of Delta Meadows River Park with Frederica Bowcutt for "A Floristic and Vegetation Study of Delta Meadows River Park" December 1993.
1984. Riparian vegetation transect sampling to assess effects of water diversion for small hydroelectric projects, Mono and Inyo counties, eastern Sierra Nevada streams. Southern California Edison project for Jones and Stokes Associates, Inc., Sacramento, CA.
1985. Vegetation mapping and impact assessment of the Calabasas Creek Flood Control Project, Santa Clara County, CA Riparian Systems, Inc. Mill Valley, CA.
- 1986-1990. Rare Plant Surveys, Habitat mapping, and impact analysis of several alternative Department of Water Resources channel improvement projects in the Sacramento-San Joaquin Delta. for Ecos, Inc., Sacramento, CA.
1989. Revegetation of Elk Grove Creek, Designing for flood tolerance, water requirements. Chuck Watson and Associates, Sacramento, CA.
1989. Field assistant and botanical consultant for wetland delineation training class. Sacramento, CA. Wetland Training Institute, MS.
- 1989-1995. Vernal pool mitigation design, construction and monitoring, Rocklin, CA. Huffman and Associates, Inc., Larkspur, CA.
- 1991 Delta Wetlands Project. Rare Plant Surveys on and around four delta islands for a water resource development project. Jones and Stokes Associates Inc., Sacramento, CA.
1991. Field assistant for ACOE Wetland Delineation Classes, Sacramento Valley. U.S. Army Corps of Engineers, Waterways Experiment Station, VA.
- 1990-1991. Wetland mapping, vernal pool mitigation monitoring, rare plant surveys for development lands in Chico, CA, Huffman and Associates, Inc.
- 1990-1993. Vernal pool mapping, mitigation monitoring, and rare plant surveys, Foothill Park, Chico, CA. Gibson and Skordal, Inc. Sacramento, CA.
1990. Review of vernal pool wetlands mitigation and monitoring plan for Shaliko Golf and Country Club, Sacramento County, CA., County of Sacramento, CA.
- 1990 Delineation of Wetland Areas, Russell Ranch, Sacramento County California, Balance Hydrologics Berkeley, CA.

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1993. Wetlands delineation and sensitive plant surveys for three military installations: McClellan Air Force Base, Lincoln Antenna Facility, and Davis Antenna Facility, U.S. D.O.D. for California Nature Conservancy, San Francisco, CA.
- 1993-1994 Vernal pool mitigation monitoring Perry Ranch, Sacramento, CA, Gibson and Skordal, Inc., Sacramento, CA.
1993. Wetlands delineation and sensitive plant surveys for three military installations: McClellan Air Force Base, Lincoln Antenna Facility and Davis Antenna Facility, California Nature Conservancy, San Francisco, CA.
1993. Wetland mitigation design and monitoring program, development lands, Placer County, CA. Spannegal and Associates, Inc.
1993. Wetland Plant Identification class field instructor, Sacramento Valley, CA. U.S. Fish and Wildlife Service, Sacramento, CA.
1994. Wetland delineation and wetland plant identification, Petaluma, CA. Environmental and GIS consulting, Inc, Bentonville, AR.
1994. Wetland Plant Identification class instructor, EPA, San Francisco. Huffman and Associates, Inc. Larkspur, CA.
1995. Wetland Delineation and rare plant surveys on forest land exchange parcels, Plumas County, CA PAR Environmental Associates, Inc., Sacramento, CA.
- 1995 -1996. Wetland delineation, vegetation mapping, and rare plant surveys on 11,000 acres of Plumas National Forest and private land exchange parcels, Plumas County, CA, Soper-Wheeler Company Project for PAR Environmental Associates, Inc., Sacramento, CA.
1996. Wetland mapping and rare plant surveys in vernal pools, Chico, CA. Planning Concepts, Inc. Nevada City, CA.
1997. Wetland mapping and special status plant surveys for non-emergency road work in the northern Sierra Nevada on Feather River Highway, Yuba Pass, Mohawk Valley, Lake Almanor, Grass Valley, Donner Summit and bridge repair along the Sacramento River and Dry Creek in Butte County, CA. Cal Trans project for PAR Environmental Associates, Inc., Sacramento, CA.
1997. Wetland mapping and special status plant surveys for non-emergency road work on Feather River Highway, Yuba Pass, Mohawk Valley, Lake Almanor, Grass Valley, Donner Summit and bridge repair along the Sacramento River and Dry Creek in Butte County, CA. PAR Environmental Associates, Inc., Sacramento, CA.
- 1997 Special Status plant surveys Orchard Creek vernal pool mitigation bank, Placer County CA. Wildlands, Inc. Roseville, CA

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1998. Special status plant surveys, vegetation mapping, and wetland delineation technical reports for Wentworth Springs Road, El Dorado County and El Dorado National Forest, F.H.W.A. project for Dean Ryan Consultants and Designers, Inc., Sacramento, CA.
1998. Wetland Delineation Report for California Forest Highway 105 improvement project, Yuba County, CA. Dean Ryan Consultants and Designers, Inc., Sacramento, CA.
- 1998-2000. Botanical and wetlands sections for numerous Natural Environment Studies for Caltrans road repair and improvements in Alameda, Marin, San Joaquin, San Mateo, Santa Clara, and Sonoma Counties, PAR Environmental Associates, Inc., Sacramento, CA.
2000. *Illustrated Field Key to Sierra Nevada Epilobium*. Field surveys in Yuba, Nevada, and Inyo Counties for Epilobium and technical document. USDA Forest Service, Tahoe National Forest for Garcia and Associates, Nevada City, CA.
2000. Special Status Plant and Noxious Weed Surveys, General Vegetation and Riparian Vegetation mapping, P.G. & E. and Tri-Dam Stanislaus River project, Tuolumne County, CA. Garcia and Associates, Nevada City, CA.
2000. Special Status Plant and Noxious Weed Surveys, General Vegetation and Riparian Vegetation mapping, Pit River 3, 4, 5 hydroelectric projects, Shasta County, CA., PG&E project for Garcia and Associates, Nevada City, CA.
- 2000 Riparian vegetation classification, mapping, and analysis of riparian vegetation changes from historical photography, Pit and Feather Rivers, Garcia and Associates, San Anselmo, CA
- 2000 Wetland technical reports for Federal Highway projects in Butte and Trinity counties, Dean Ryan and Associates, San Diego, CA.
- August 2000, Biota Biological, Sacramento, CA Rare Plant surveys of river and slough crossings for Stream Energy and Calpine 3D geophone investigations of the north delta including Delta Meadows and Snodgrass Slough.
2001. Special status plant survey, vegetation mapping, and wetland delineation technical reports for Blue Lakes Road, Alpine County, F. H. W. A. project for Dean Ryan Consultants and Designers, Inc., Sacramento, CA.
- 2000-2002. Special status plant survey, vegetation mapping, wetland delineation technical reports, and Valley Elderberry Beetle habitat surveys for Oro-Quincy Highway, Butte County, CA., F. H. W. A. project for Dean Ryan Consultants and Designers, Inc. Sacramento, CA.
2001. Alderpoint road wetland delineation and habitat mapping. Trinity County. Dean Ryan Consultants and Designers, Inc.
- 2001 Vernal pool vegetation expert for delineation of vernal pool wetlands at proposed UC Merced Campus. EIP Associates, Sacramento, CA

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2002. Expert witness on riparian vegetation and montane wetlands for legal challenge to the June 2000 Merced Wild And Scenic River Comprehensive Management Plan and Final Environmental Impact Statement, for Friends of Yosemite Valley and Mariposans for Environmentally Responsible Growth, Mariposa, CA.
2002. Wetland Delineation and special status plant survey, Road 416 Tulare and Fresno Counties. PAR Environmental, Sacramento, CA.
- 2002 Wetland Delineation for City of Antioch. PAR Environmental, Sacramento, CA.
2003. Observations On The Vegetation And Habitats For Special Status Plants At Lake City Meadow, Derbec Meadow And Diggins Pond Areas Within Malakoff Diggins State Historic Park, Nevada County, Ca., special status plant and montane meadow assessments for fire management plan, California State Parks Department project for Safe Solutions Group, Berkeley, CA.
2003. Wetland delineation and special status plant survey along SR161, Paradise. Butte County, CA. for PAR Environmental, Sacramento, CA.
2003. Special Status plant survey for Faria Ranch, San Ramon, Alameda County, CA. for Huffman and Associates, Inc., Larkspur, CA.
2003. Special Status plant survey for Walker Ranch, Lake Almanor, Plumas County, CA. for Huffman and Associates, Inc. Larkspur, CA.
2003. Wetland Delineation for the U.S. Army Corps of Engineers Merced Streams project, Burns Reservoir and Bear Creek Reservoir, and bypass canal project areas. Field delineation, GPS mapping, and photo-interpretation of potential wetlands for Dean Ryan Consultants and Designers, Inc. Sacramento, CA.
2004. Special Status plant survey for Sky Ranch, Pittsburg, Contra Costa County, CA. for Huffman and Associates, Inc., Larkspur, CA.
2004. Special Status plant survey for Raintree Ranch, Foresthill, Placer County, CA. for Huffman and Associates, Inc., Larkspur, CA.
2004. Special Status plant survey for Clear Creek project site, Clear Creek, Lassen County, CA. for Huffman and Associates, Inc., Larkspur, CA.
2004. Special Status plant survey for Pittsburg Power Plant, Contra Costa Power Plant, Montezuma Enhancement Site, Mirant Electric, Contra Costa and Solano Counties, CA. for Huffman and Associates, Inc., Larkspur, CA.
2004. Special Status plant survey for Hoover Ranch, Bethal Island, Contra Costa County, CA. for Huffman and Associates, Inc., Larkspur, CA.
2004. Preliminary constraints analysis for wetland and rare plants on Home Depot site, Elk Grove, Sacramento County CA. for PAR Environmental, Sacramento, CA.

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- 2004. Natural Environment Study for wetlands and rare plants on four Cal Trans interchange projects, Modesto, Stanislaus County CA. for PAR Environmental, Sacramento, CA.
- 2004. Natural Environment Study for wetlands and rare plants and significant trees along Auburn Blvd. Citrus Heights, Sacramento County, CA for PAR Environmental, Sacramento, CA.
- 2004. Purple Amole Monitoring Program, establish baseline transects and plots, study design, natural history and taxonomic review. Camp Roberts, Monterey County CA, for California Air National Guard, Sacramento, CA.
- 2005. Vegetation mapping along powerline right of ways and access roads for Western Power. Burleson Consulting, Folsom, CA.
- 2005. Special status plant habitat assessment and preliminary wetland delineation for initial study and alternatives analysis for EBMUD Comanche Reservoir sewer treatment plant. Ecobridges, Nevada City, CA.
- 2005. Wetland delineation and rare plant survey, Folsom Blvd. widening project, Sacramento, CA. PAR Environmental, Sacramento, CA.
- 2005. Special status plant survey. Sacramento Country Day School, Sacramento, CA.
- 2005. Special status plant survey, Rockville development site, for Huffman and Associates, Inc. Larkspur, CA.
- 2005. Nevada County habitat management plan, Rollins Lake properties, for Ecobridges, Nevada City, CA.