



## **Michael D. White, Ph.D.—Curriculum Vitae**

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### **Conservation Biology Institute**

#### **San Diego Office**

651 Cornish Drive

Encinitas, CA 92024

Phone: (760) 634-1590

Fax: (760) 634-1590

Email: [mdwhite@consbio.org](mailto:mdwhite@consbio.org)

### **SUMMARY**

Dr. White is a Senior Ecologist with over 20 years of experience conducting ecological research, developing species and habitat conservation programs, and conducting impact assessment studies throughout the Southwestern U.S. and the Pacific Rim. His project experience includes conservation assessments and multiple species conservation planning, lake management and water quality assessments, riparian and stream assessments and restoration, aquatic invertebrate ecology, ecological risk assessments, environmental impact analyses, resource management plans, and regulatory compliance for wetlands and endangered species. Dr. White has extensive limnological experience, and his technical expertise includes the ecology of aquatic and riparian habitats, water resources management, and use of GIS for environmental analyses. His research interests are exploring the interrelationships of hydrological and biological characteristics and how they are influenced by land use and water management practices.

Dr. White's recent projects have involved conducting landscape-scale conservation assessments, developing water quality management strategies, conducting wildlife corridor assessments and habitat linkage planning studies, and developing habitat management plans for preserve areas within the San Diego Multiple Species Conservation Program (MSCP) preserve system. These projects involve coordination with local governmental agencies (e.g., City of San Diego, San Diego Association of Governments), state and federal wildlife and land management agencies (i.e., California Department of Fish and Game, U.S. Fish and Wildlife Service, Bureau of Land Management), local academic and research institutions (San Diego State University, San Diego Natural History Museum, U.S. Geological Survey, San Diego Supercomputer Center) and non-governmental organizations (e.g., The Nature Conservancy, Pronatura, National Wildlife Federation, Southwest Wetlands Interpretive Association, Endangered Habitats League, Back Country Land Trust). Dr. White serves on the County of San Diego's Biological Advisory Panel, and also serves on the Technical Advisory Committee of the San Diego Tracking Team, a volunteer organization that conducts wildlife tracking studies and promotes environmental awareness in San Diego County.

Dr. White is a board member of the non-profit Conservation Biology Institute and manages the Institute's Southwestern Operations office. He is an Adjunct Associate

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Professor in the Biology Department and a Faculty Associate at the Center for Inland Waters at San Diego State University. Dr. White regularly lectures on a variety of subjects, including habitat conservation planning, experimental design and statistical analysis, limnology and aquatic ecology, and ecological risk assessment.

### **EDUCATION**

Ph.D. Ecology, San Diego State University and University of California, Davis, 1991.  
Dissertation: Horizontal distribution of pelagic zooplankton in relation to predation gradients.

B.A. Ecology, Behavior and Evolution, University of California, San Diego, 1982.

### **PERSONAL**

Born July 20, 1960, Los Angeles, California (citizen of U.S.A.).

Married.

### **PROFESSIONAL ORGANIZATIONS AND AFFILIATIONS**

Adjunct Professor, San Diego State University

Faculty Associate, Center for Inland Waters, San Diego State University

Society for Conservation Biology

Ecological Society of America

American Society for Limnology and Oceanography

Societas Internationalis Limnologiae

Southwest Association of Naturalists

Arizona Riparian Council

Dr. White holds an Endangered Species Act 10(a)(1)(A) Scientific Collecting Permit (#TE027425-0) for the following species listed under the Act:

- Conservancy fairy shrimp (*Branchinecta conservatio*)
- Longhorn fairy shrimp (*Branchinecta longiantenna*)
- Riverside fairy shrimp (*Streptocephalus woottoni*)
- San Diego fairy shrimp (*Branchinecta sandeigonensis*)
- Vernal pool fairy shrimp (*Branchinecta lynchi*)
- Vernal pool tadpole shrimp (*Lepidurus packardii*)

### **EMPLOYMENT HISTORY**

July 1999 – present. Senior Ecologist and San Diego Director of the Conservation Biology Institute, San Diego, California. Providing administrative and fiscal oversight of a four-person operation with a budget of approximately \$500K/yr. Responsibilities include marketing and proposal preparation, oversight of office contracts, staff

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timekeeping and project tracking, accounts payable, accounts receivable, and project management and technical studies.

September 1991 – present. Adjunct Professor, San Diego State University, San Diego California.

July 1998 – July 1999. Senior Technical Specialist. Ogden Environmental and Energy Services Co., Inc., San Diego, California. Responsibilities included providing technical oversight of the Lower Colorado River Multiple Species Conservation Program project and senior technical support of project staff.

January 1997 – June 1998. Manager, Aquatic Sciences Group. Ogden Environmental and Energy Services Co., Inc., San Diego, California. Managed a group of nine professional aquatic scientists with revenues of approximately \$2M/year. Responsibilities included administration, marketing and proposal preparation, strategic planning, annual budgeting and performance tracking, timekeeping oversight, personnel supervision (including direct supervision of four professional biologists), project management, and project technical support.

January 1994 – December 1996. Deputy Manager, Biological Resources Group, Ogden Environmental and Energy Services Co., Inc., San Diego, California. Deputy manager for a group of 23 professional biologists. Responsibilities included, marketing and proposal preparation, strategic planning, annual budgeting, group health and safety program oversight, personnel supervision (including direct supervision of five professional biologists), project management, and project technical support.

September 1989 – July 1994. Senior Ecologist, Ogden Environmental and Energy Services Co., Inc., San Diego, California. Responsibilities included marketing and proposal preparation, project management, project technical support, and direct supervision of three professional biologists.

September 1983 – December 1990. Graduate Assistant, San Diego State University, San Diego, California.

July 1984 – June 1985. Graduate Assistant, UC Davis Tahoe Research Group, Lake Tahoe City and Davis, California.

## SELECTED PROJECT EXPERIENCE

### REGIONAL HABITAT CONSERVATION PLANNING, MONITORING, RESTORATION AND MANAGEMENT

**Tejon Ranch Reserve Design.** CBI, working with the South Coast Wildlands Project, is developing a science-based reserve design for the 270,000-acre Tejon Ranch. The reserve design uses a series of conservation planning principles and the results of previous CBI studies conducted for the Ranch to design and justify a reserve that captures regional conservation objectives, such as habitat representation goals, protection of intact watersheds, rare and endangered species protection and recovery, and maintenance of intact core reserve areas. The reserve design is undergoing review by a peer review group of academics, resource agency staff, and local experts. The final reserve design will be provided to stakeholders with an interest in significant conservation on Tejon Ranch for use in negotiations with the landowner.

**El Monte Valley Restoration Project – Endangered Habitats Conservancy.** Lead scientist directing restoration planning for approximately 450 acres of the San Diego River and its floodplain in the El Monte Valley, Lakeside, California. The riverine functions and values of the site are compromised by a lack of surface-water hydrology due to the El Capitan dam upstream of the site, lowered groundwater elevations from groundwater withdrawals, and significant invasion of the river channel by exotic species. The project entails coordinating the design of the restoration project with a groundwater recharge project proposed for the Valley by the Helix Water District.

**Conservation Assessment of Ranch Guejito.** CBI prepared a conservation assessment for the 20,000-acre Rancho Guejito in northern San Diego County, one of the most important conservation targets in the region. The assessment documents the conservation significance of Rancho Guejito from both a natural and cultural resources perspective. The assessment evaluated the resources of Rancho Guejito within a Southern California regional context, and assessed its potential contribution to conservation of landscape-scale processes, protecting intact watershed basins, under-protected vegetation associations, and key sensitive species, as well as prehistoric and historic cultural resources. The assessment is being used by conservation organizations to justify and develop strategies for conservation of the property.

**Las Californias Binational Conservation Initiative – San Diego Foundation and Resources Legacy Fund Foundation.** In partnership with the Mexican non-governmental organization, *Pronatura*, and The Nature Conservancy, CBI is designing a conservation reserve system for a 2.5 million-acre area of southern California and northern Baja California. The study area extends from the Sweetwater River watershed in California to the Rio Guadalupe watershed in Baja California. The project is making use of the reserve selection algorithm, *SPOT*, to select a reserve portfolio. The project has required extensive manipulation and merging of various U.S. and Mexican digital

datasets (e.g., land cover, roads, digital elevation models, etc.) and cross-walking of different vegetation classification systems.

**Central Sierra Nevada Science Assessment – The Trust for Public Land.** Ownership in the Central Sierra Nevada is characterized by a “checkerboard” pattern of public and private land, which potentially complicates management of the landscape for conservation, recreational, and timber harvest values. CBI is conducting a science assessment of the Central Sierra to identify high resource value areas, threats to these resources, and spatially explicit management strategies that could be implemented by TPL and their partners to improve resource values. CBI is working with TPL and their conservation partners for the project, Sierra Nevada Forest Protection Campaign and California Wilderness Coalition. As part of the assessment, CBI has assembled and will work with a Scientific Advisory Panel, comprised of academics and resource agency staff with relevant experience in the Sierra Nevada.

**Tejon Ranch Conservation Assessments – Environment Now and Resources Legacy Fund Foundation.** Principal investigator for assessments that characterized the conservation value of the 270,000-acre Tejon Ranch, California. The Conservation Significance Project was conducted in partnership with the South Coast Wildlands Project and California Wilderness Coalition. The Conservation Significance Project made use of available data, museum records, and expert opinion and assessed the biogeographic importance of the Tejon Ranch, its core habitat and natural community representation values, roadlessness, terrestrial and watershed integrity, importance as a habitat linkage, and habitat for rare and endangered species. CBI also conducted an additional Conservation Assessment Project that predicted the distribution of a set of conservation values across Tejon Ranch. Conservation values included threatened, endangered and endemic species distributions, roadless areas analysis, watershed integrity analysis, habitat diversity and regionally under-protected vegetation communities. As part of the Conservation Assessment Project, CBI conducted a remote sensing analysis to update information on roads, land cover, and vegetation community distributions.

**Framework Management Plan for the Ramona Grasslands – The Nature Conservancy.** CBI is developing a framework management plan for the Ramona grasslands in central San Diego County. The Ramona Grasslands are a regionally important conservation area, supporting a variety of target resources, including vernal pools and rare vernal pool species, Stephens’ kangaroo rat, wintering and breeding raptors, riparian habitats and arroyo southwestern toads, and native grasslands. The Ramona Grasslands are currently grazed by cattle, which maintain habitat suitability for some species but adversely affect other natural resources. The intent of the framework management plan is to lay out a scientific basis for implementing management activities, describe experimental manipulations to increase our understanding of the dynamics of the system, and to develop a biological monitoring program to assess changes in resource states.

**South Coast Missing Linkages Project – South Coast Wildlands Project.** Working on a project in partnership with the South Coast Wildlands Project, The Nature Conservancy, and Pronatura to conduct planning studies on five important habitat linkages in the U.S.-Mexico border region. The Conservation Biology Institute is taking the lead on two of the five linkages. One is linking National Forest land in the Laguna Mountains with important habitats in Baja California through the Campo Valley area of San Diego County. The other is linking habitats in the Jacumba Mountains with those in the Sierra Juarez in Baja California. The project will result in a detailed comprehensive report describing threats and conservation opportunities for each of the five linkages described above. The report will also evaluate the likely biological impacts of losing ecoregional connectivity in these areas.

**Habitat Management Planning for the Lake Hodges/San Pasqual Valley MSCP Preserve Area – City of San Diego.** Project manager for the development of a habitat management plan for the over 9,000-acres Lake Hodges/San Pasqual Valley MSCP Preserve Area. Coordinated a team of specialists associated with CBI, local biologists, the U.S. Geological Survey, and San Diego State University to conduct baseline surveys and map the distributions of key resources, including vegetation communities, rare plants, Hermes Copper butterfly, herpetofauna (including arroyo southwestern toad), and breeding riparian birds (including least Bell's vireo and southwestern willow flycatcher). The management plan addressed issues such as control of adjacent land use impacts, fire management, recreational access, fencing, exotic species control, monitoring, and research.

**Monitoring Program for the Santa Margarita River – The Nature Conservancy.** Developed a program to monitor future potential changes on the Santa Margarita River associated with modification of base flows resulting from a water rights settlement on the river. Base flow augmentation resulting from the settlement has been designed to mimic natural discharge patterns historically observed in the river. The monitoring plan was structured around geomorphically distinct reaches of the river that are anticipated to respond similarly to river hydrology. Elements considered in the monitoring plan include biological resources (riparian and coastal stream communities), water quality, discharge, and channel geomorphics. The objective of the monitoring program is to quantify conditions prior to the modification of base flows and to track changes following base flow augmentation.

**Multiple Species Conservation Program – City of San Diego Clean Water Program.** Participated in development of a conservation and management plan for federally listed species and key candidate species and their habitats in a 900-square-mile area in San Diego County. Coordinated the development of a GIS-based habitat evaluation model, prepared hydrologic management guidelines for the preserve system, and assisted with development of the species and habitat monitoring program for the preserve system.

**Regional Conservation Planning and Constraints Analyses for Eastern San Diego Mountains – The Nature Conservancy.** Worked with The Nature Conservancy and a team of regional scientific experts to prioritize conservation opportunities for a 400,000-acre area in San Diego County that includes the headwaters of five major watersheds. The study involved development and review of a spatial and non-spatial database for the area, identification of regionally important resources and landscape connections, and a gap analysis to identify regionally important resources that were in private ownership and zoned for development or agriculture. CBI identified and evaluated the potential effects of land uses and other stressors, including those that may affect downstream portions of the watersheds. CBI and a team of scientists conducted biological surveys of selected properties. As a result of the studies, CBI prepared a conservation strategy report that identifies conservation priorities, research needs, land use constraints, potentially compatible land uses and appropriate locations, restoration opportunities, and habitat management goals.

**MSCP Monitoring Program Coordination – California Department of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS) and City of San Diego.** Working with the City of San Diego and other San Diego County jurisdictions, USFWS, and CDFG to implement the Subregional Biological Monitoring Program for the San Diego MSCP. As part of this effort, CBI is compiling an inventory of existing monitoring efforts in western San Diego County, developing a strategic framework of the roles and responsibilities of the monitoring partners, refining biological monitoring protocols, developing structures and protocols for managing large biological databases, formulating a strategy for developing a centralized database repository, and developing a web site to disseminate MSCP-related information to the public.

**Regional Biological Monitoring Plan for the Multiple Habitats Conservation Program – San Diego Association of Governments.** Developing a regional biological monitoring plan for the North Coastal San Diego County Multiple Habitats Conservation Program (MHCP). The plan is being developed in coordination with the California Department of Fish and Game and the U.S. Fish and Wildlife Service and the seven North San Diego County cities participating in the MHCP. The MHCP biological monitoring program is intended to provide a systematic data collection effort to gauge the progress and success of the habitat preserve system. The plan addresses regional monitoring objectives and describes specific monitoring approaches for riparian communities, uplands, vernal pools, coastal lagoons, and wildlife movement corridors within the preserve system.

**Habitat Management Planning for the Marron Valley Preserve Area – City of San Diego.** Project manager for the development of a habitat management plan for the 2,600-acre Marron Valley MSCP Preserve Area. Coordinated a team of biologists associated with CBI, the U.S. Geological Survey, and the San Diego Natural History Museum to conduct baseline surveys and map the distributions of key resources, including vegetation communities, rare plants, Quino checkerspot butterflies, herpetofauna (including arroyo

southwestern toad), and breeding riparian birds (including least Bell's vireo and southwestern willow flycatcher). Dr. White conducted surveys for the endangered San Diego fairy shrimp in vernal pools on the property. The management plan addressed issues such as cattle grazing, fire management, access, fencing, exotic species control, monitoring, and research.

**Wildlife Corridor Monitoring Study – City of Poway and City of San Diego.** The study evaluated the use of designated wildlife corridors by target mammal species, including mountain lions, bobcats, coyotes, mule deer. Field monitoring was conducted in the Los Penasquitos, Carmel Valley, Carmel Mountain/Del Mar Mesa, and eastern Poway areas by a graduate student and by a local volunteer organization using different methodologies over several seasons. CBI analyzed the data generated to assess the functionality of the wildlife corridors and to compare the methods.

**Lower Colorado River Multi-Species Conservation Program – National Fish and Wildlife Foundation.** Served as a technical consultant to the plan development team for the Lower Colorado River Multiple Species Conservation Program (LCR MSCP). The LCR MSCP plan is being prepared for a consortium of federal and state agencies (California, Nevada, and Arizona), water and hydropower interests, and Native American Tribal governments. The LCR MSCP was initiated to optimize opportunities for current and future water and power development in the lower Colorado River basin, while working towards conservation of listed and selected unlisted species and their habitats in compliance with both the federal and California Endangered Species Acts. The result of the plan will be the issuance of incidental take authorizations under Sections 7 and 10(a)(1)(B) of the Endangered Species Act, and Section 2835 of the California Natural Communities Conservation Program Act for those species deemed to be adequately addressed by the plan, through a combination of conservation, management, restoration, and operational measures.

Responsibilities include providing overall technical oversight for the project team. Current efforts involve the development of a conservation strategy for the program and alternatives for evaluation under the California Environmental Quality Act and National Environmental Policy Act. The conservation strategy will involve a strong riparian habitat restoration component, which involves integrating the requirements of riparian species with the hydrologic and hydraulic conditions on the river in light of future water management scenarios (e.g., intrastate water transfers to achieve compliance with California's 4.4 Plan, offstream storage and interstate transfer rules). Implementation of the conservation strategy will have to consider large-scale water management activities and water accounting practices dictated by the large body of legislation and court decrees collectively known as the Law of the River.

## TECHNICAL STUDIES

**Fairy Shrimp Survey Protocol Analysis – Western Riverside County Regional Conservation Authority.** Dr. White performed an analysis of Endangered Species Act section 10(a)(1)(A) fairy shrimp survey data to assess the adequacy of a single survey, as opposed to multiple surveys, in detecting fairy shrimp in vernal pools. The analysis used the survey data to determine the conditional probability of detecting shrimp in the second survey period if shrimp either were or were not collected in the first survey period.

**The Influence of Watershed Urbanization on the Hydrology and Biology of Los Peñasquitos Creek – The San Diego Foundation Blasker Rose-Miah Fund.** Dr. White was awarded a research grant to study the effects of urbanization in the Los Peñasquitos Creek watershed. The Los Peñasquitos Creek watershed is a small coastal watershed in San Diego, California that contains significant areas of conserved natural habitats, but has experienced rapid urban growth. The study examined how patterns of land use change in the Los Peñasquitos Creek watershed have affected downstream hydrology of the creek, channel geomorphology, and associated riparian vegetation communities. The research showed that urbanization of the watershed has resulted in significant increases in discharge, annual runoff, flood peaks, and dry-season flows. These hydrologic changes have driven changes in the distribution and composition of riparian habitats associated with Los Peñasquitos Creek.

**Source Water Protection Guidelines – The City of San Diego Water Department.** Providing technical assistance to City of San Diego Water Department staff for a project to develop development guidelines intended to ensure protection of the quality of San Diego source water supply reservoirs. The project is being conducted by a consulting firm, Brown and Caldwell, and Dr. White is serving as a technical advisor directly to the City.

**Guajome Lake Water Quality Assessment Project – County of San Diego.** Project manager for a water quality study at Guajome Lake in northern San Diego County funded under the U.S. Environmental Protection Agency's (USEPA) Clean Lakes Program. The focus of the project was to characterize water quality in the lake through field sampling and chemical analysis of soil, sediment, stream flow, and lake water to identify pollution problems in the lake and its watershed. The project included preparation of a Quality Assurance Project Plan (QAPP), assessing historic uses of agricultural chemicals in the watershed, estimating sediment and chemical constituent loadings to the lake with watershed modeling techniques, developing and assessing pollution control measures, and developing pollution control and water quality monitoring programs for the lake.

**San Diego River Live Stream Discharge Studies – City of San Diego.** Biology task manager for analysis of potential effects of live stream discharge of reclaimed water to the San Diego River. Objectives of the study were to determine the feasibility of a live stream discharge program in light of the potential effects to wetlands (including habitat for the endangered least Bell's vireo), aquatic fauna, water quality, and public health.

Responsibilities included an assessment of the effects of varying quantities of live stream discharge on fisheries habitat, riparian and salt marsh wetlands, wetland-associated terrestrial species, and disease vectors. Completion of this task required interpretation of the QUAL2E water quality model output and hydraulic modeling output.

**Salton Sea Water Quality Management Project – Salton Sea Authority.** Project manager for a program funded under a USEPA Clean Lakes Grant, which summarized and presented environmental and economic analyses of salinity and surface elevation management alternatives at the Salton Sea. Contracted with the Salton Sea Authority, a Joint Powers Authority comprised of the counties of Imperial and Riverside, the Imperial Irrigation District, and the Coachella Valley Water District. The purpose of the project was to identify, summarize, and evaluate alternatives for managing the salinity and elevation of the Salton Sea. The project entailed interaction with the USEPA, U.S. Army Corps of Engineers, Bureau of Reclamation, U.S. Fish and Wildlife Service, California Department of Fish and Game, Regional Water Quality Control Board, California Environmental Protection Agency, and local citizens groups to identify and summarize their concerns.

**Olivenhain Reservoir Limnological Assessment – Olivenhain Water District.** Project manager and technical lead for the assessment of anticipated limnological conditions of a planned reservoir in San Diego County. The assessment projected anticipated thermal stratification and dynamics of nutrients, dissolved oxygen, and other water quality constituents. Recommended design features to better manage water quality in the reservoir, including a multi-port outlet tower to allow selective withdrawals, artificial circulation/hypolimnetic aeration, and a separate inlet structure for aqueduct inflows.

**Fairy Shrimp Survey and Assessments – Twentynine Palms Marine Corps Air Ground Combat Center.** Task manager overseeing field surveys of anostracans (primarily fairy shrimp) in desert playas and impact assessments of base operations on these resources. Field surveys involved collecting samples of sediments containing anostracan eggs that were reared in controlled conditions in the laboratory. The impact assessment primarily evaluated the effects of vehicle traffic (e.g., tanks and armored personnel carriers) to desert playa habitats.

**Fairy Shrimp Surveys – Rancho del Rey, City of Chula Vista.** Performed field surveys of remnant vernal pools on Otay Mesa to characterize the fairy shrimp fauna on a proposed development site.

**Fisheries Survey – Newhall Land and Farming.** Conducted a field survey of native fishes in the Santa Clara River, Los Angeles County, California, as part of an emergency road crossing project. The purpose of the survey was to document the species present in the study area and to relocate fish potentially impacted by construction operations to areas outside of the impact zone as conditioned in the California Department of Fish and Game Streambed Alteration Agreement for the project. Species of particular interest

were threespined stickleback (*Gasterosteus aculeatus*), arroyo chub (*Gila orcutti*), and Santa Ana sucker (*Catostomus santaanae*).

**Impacts of Threadfin Shad on Largemouth Bass – San Diego State University.** Participated in a project to examine the impacts of threadfin shad introductions on aquatic biota in southern California reservoirs. Sampled fish and plankton, conducted physical and chemical analyses, and conducted echosounding in six lakes in San Diego County. Identified zooplankton and provided statistical review.

**Impacts of Opossum Shrimp on Zooplankton – Tahoe Research Group.** Participated in a project assessing the impacts of opossum shrimp (*Mysis relicta*) introductions on Lake Tahoe zooplankton. Installed experimental enclosures with scuba, sampled and counted zooplankton, and analyzed data. Performed a variety of routine limnological analyses such as collection of temperature, oxygen, and nutrient profiles. Conducted short-term opossum shrimp feeding experiments.

#### **ENVIRONMENTAL IMPACT ANALYSIS AND REGULATORY COMPLIANCE**

**Martis Valley Community Plan – Sierra Watch and Mountain Area Protection Foundation.** Conducted a review and provided comments on the Environmental Impact Report prepared for the update to the Martis Valley Community Plan on behalf of Sierra Watch and Mountain Area Protection Foundation. To assist with critiquing the biological resources analyses in the EIR, CBI developed a natural resources conservation vision for the Martis Valley and identified how the proposed developments authorized under the proposed Community Plan would adversely affect these resources. Participated in landowner negotiations over development designs and provided litigation support.

**Evaluation of the Cabo San Quintín Development Project and Environmental Impact Study – *pro esteros* and Endangered Habitats League.** Conducted an evaluation of the proposed Cabo San Quintín development plan and associated Mexican environmental impact study (Manifestación de Impacto Ambiental) for the Punto Mazo peninsula, San Quintín, Baja California, Mexico. The evaluation discussed inadequacies and inconsistencies of the environmental analysis, and presented an independent analysis of key project features and their potential impacts. Key points discussed in the evaluation included the inadequate consideration of Mexican endangered species laws, state land use regulations, potable and irrigation water supply issues, waste water treatment and potential nutrient loading, potential effects of marina dredging on the Bahía San Quintín, potential impacts to endemic species and sensitive habitats, and potential socioeconomic impacts associated with the increased regional infrastructure and services needs that would result from implementing the project.

**Wetlands Permitting, Mission Valley West Light Rail Transit – Metropolitan Transit Development Board.** Project manager responsible for coordinating wetlands and endangered species permitting for the Mission Valley West Light Rail Transit

project. Conducted a Section 404(b)(1) alternatives analysis, selected potential riparian mitigation sites, acted as permitting agency liaison, coordinated development of a wetlands mitigation plan, conducted U.S. Army Corps of Engineers 404 and California Department of Fish and Game Streambed Alteration Agreement permitting, and coordinated Section 7 consultation for the endangered least Bell's vireo.

**Wetlands Permitting and Mitigation Plan, East Mission Gorge Sewer Interceptor Force Main and Pump Station – City of San Diego Water Utilities Department.** Prepared a detailed wetlands mitigation plan for impacts associated with the construction of a sewage pump station and force main. The wetlands mitigation plan was developed in consultation with the U.S. Fish and Wildlife Service, California Department of Fish and Game, and City of San Diego. The mitigation plan was required for the U.S. Army Corps of Engineers' Section 404 and California Department of Fish and Game 1601 permitting process. Also conducted the biological resources impact analysis for the California Environmental Quality Act (CEQA) compliance.

**Evaluation of the Draft Environmental Impact Report for the Martis Valley Community Plan Update, Placer County, California – Sierra Watch.** Conducted an evaluation of the Biological Resources analysis in the Draft Environmental Impact Report (DEIR) prepared for the Martis Valley Community Plan update. The Community Plan Update proposed alternatives that would change development patterns in the Martis Valley Community Planning Area, Placer County, California. These impacts would have potentially significant impacts to high value terrestrial and aquatic resources, including forests, shrub communities, meadows, and stream systems. CBI prepared comments on behalf of Sierra Watch that discussed deficiencies in the presentation and analysis of biological information in the DEIR and recommended analyses that would provide better information on the potential impacts of proposed land use changes on resources in the area.

#### **CONSERVATION OUTREACH, TRAINING, AND EDUCATION**

**San Dieguito River Watershed Information System – San Dieguito River Valley Conservancy.** Directed the development of a Geographic Information System (GIS) based information system that will assist the Conservancy and the San Dieguito River Valley Joint Powers Authority (JPA) with planning, land acquisition and conservation, and community outreach. The project was funded by the San Diego Foundation. The GIS tool combines available regional data layers such as land use, land ownership, biological resources information, topography, water resources information, and political boundaries, into a user-friendly mapping and analysis tool. The tool allows staff at the Conservancy and JPA to combine various data layers for environmental analyses, to track resource and land status in the watershed, and to create maps and displays for outreach purposes.

**Conservation Resource Center Feasibility Study – San Dieguito River Valley Conservancy.** CBI prepared a study evaluating the feasibility and desirability of establishing a resource support service for conservation groups in San Diego County. The first phase of the study included an exploratory workshop and discussions with individuals from the San Diego conservation community about alternative strategies for sharing resources. CBI conducted research on other organizational models across the country and evaluated the local availability of technical services. We prepared a report summarizing the results of our study and that provided recommendations on a structure and strategy for developing a resource center.

**Aquatic Ecology Training Program – Campo Environmental Protection Agency.** Conducted training of tribal members working for the Campo Band of Mission Indians Environmental Protection Agency (Campo EPA) in aquatic and riparian resource ecology, inventory, and restoration. The program was funded under Section 106 of the Clean Water Act. The ultimate goal of the program was to provide tribal members sufficient training to allow for an efficient and effective transition of delegation of authority over water resources matters to the Campo Band. Conducted training in riparian ecology, aquatic invertebrate ecology, Rapid Bioassessment Protocols, and stream and riparian restoration techniques.

**Lake Ecology Display – City of San Diego.** Developed an educational display for “Lake Day” sponsored by the City of San Diego Recreational Lakes Program and held at Lake Morena, San Diego County, California. The display included a presentation of physical dynamics of lake (thermal stratification and turnover), oxygen dynamics, microscope viewing of zooplankton, and a listing of local fish species. Questions from the public were entertained.

#### **ECOLOGICAL RISK ASSESSMENTS**

**Ecological Risk Assessment, U.S. Naval Activities (NAVACTS), Guam – U.S. Navy.** Coordinated investigations in support of ecological risk assessments for terrestrial and freshwater habitats at four sites at NAVACTS Guam. Field studies included mapping and characterization of vegetation and wildlife habitat, floral and faunal inventories, collection of soils and sediments for toxicity tests and chemical analyses, and analysis of resident biota for contaminant bioaccumulation. This information was compared to data from offsite reference areas. These data were used to develop preliminary ecological risk assessments evaluating the potential risk that the chemicals onsite posed to aquatic and terrestrial communities. Of special concern was the potential for adverse impacts to the endangered Mariana common moorhen, which utilizes freshwater marshes in the area. Chemicals of concern for these sites included metals, pesticides, polychlorinated biphenyls (PCBs), dioxins, petroleum hydrocarbons, and polynuclear aromatic hydrocarbons (PAHs).

**Ecological Risk Assessment, Old WESTPAC Site, NAVACTS, Guam – U.S. Navy.** Coordinated field studies at NAVACTS, Guam to sample soils and freshwater sediments for chemical analyses and toxicity tests. Collected aquatic and terrestrial organisms for tissue analyses to determine bioaccumulation of chemicals found onsite. These data were used to develop a preliminary ecological risk assessment evaluating the potential risk that the chemicals onsite posed to aquatic and terrestrial communities. Of particular concern were wetlands supporting the endangered Mariana common moorhen. Chemicals of concern included metals, pesticides, PCBs, petroleum hydrocarbons, and PAHs.

**Ecological Risk Assessment RCRA Facilities Investigation – Rocketdyne Division, Boeing North American.** Task manager overseeing the development of ecological risk assessments at 36 sites at the 2,500-acre Santa Susana Field Laboratory (SSFL) for the Rocketdyne Division of Boeing North American. Supervised biologists conducting extensive field surveys of the SSFL that involved vegetation community mapping, rare plant surveys, and wildlife species inventories. Coordinated with the California Department of Toxic Substances Control (DTSC) on development of a series of “white papers” describing the approach and methodologies that will ultimately be employed to conduct the risk assessments for the SSFL. The white papers dealt with issues such as determining background concentrations, selecting contaminants of concern, proposed conceptual site models, calculation of exposure point concentrations, development of exposure model parameters, and risk-based decision criteria.

## **PUBLICATIONS AND PRESENTATIONS**

### **PUBLICATIONS AND REPORTS**

White M.D. and K.A. Greer. 2006. The effects of watershed urbanization on stream hydrologic characteristics and riparian vegetation of Los Peñasquitos Creek, California. *Landscape and Urban Planning* 74(2):125-138.

White, M.D., J.A. Stallcup, K. Comer, M.A. Vargas, J.M. Beltran-Abaunza, F. Ochoa, and S. Morrison. In press. Designing and establishing conservation areas in the Baja California-Southern California border region. In: *Border Institute VI, Transboundary Ecosystem Management*, Southwest Center for Environmental Research and Policy.

Strittholt, J.R., N.L. Stauss, and M.D. White. 2000. Importance of Bureau of Land Management Roadless Areas in the Western U.S.A. Prepared for the National Bureau of Land Management Wilderness Campaign by the Conservation Biology Institute. March.

White, M.D. 1999. The Lower Colorado River Multi-Species Conservation Program. *Arizona Riparian Council Newsletter* 12(1). January.

White, M.D. 1998. Horizontal distribution of pelagic zooplankton in relation to predation gradients. *Ecography* 21:44-62.

Hurlbert, S.H. and M.D. White. 1994. Experiments with invertebrate zooplanktivores: Quality of statistical analysis. *Bulletin of Marine Science* 53(2):128-153.

White, M.D. 1993. Morphological characteristics of threespined sticklebacks (*Gasterosteus aculeatus*) from the Sweetwater River, San Diego County, California. *Proceedings of the Western Association of Fish and Wildlife Agencies 73rd Annual Conference*. Pages 219-224. July.

### PRESENTATIONS

White, M.D., J.A. Stallcup, K. Comer, M.A. Vargas, J.M. Beltran-Abaunza, F. Ochoa, and S. Morrison. 2004. Designing and establishing conservation areas in the Baja California-Southern California border region. Presented at Border Institute VI, Transboundary Ecosystem Management, organized by the Southwest Center for Environmental Research and Policy. April.

White, M.D. and K.A. Greer. 2003. The effects and conservation implications of watershed urbanization in a Southern California stream system. Presented at the Society for Conservation Biology Annual Meeting, Duluth, Minnesota. July.

White, M.D. 2003. The influence of human land use modifications on Southern California stream hydrology. Presented at the Western Division of the American Fisheries Society Annual Meeting, San Diego, CA. April.

Stallcup, J.A. and M.D. White. 2002. Wildlife corridor monitoring for the Multiple Species Conservation Program. Presented at the MSCP Annual Workshop. San Diego, CA. October.

White, M.D. 2002. A review of the ecological effects of roads with examples from Southern California. Presented to the National Research Council Committee on the Ecological Impacts of Road Density. Newport Beach, California. June.

White, M.D. and J.A. Stallcup. 2000. The Lower Colorado River – Conservation planning in a degraded riverine ecosystem. Presented at the Society for Conservation Biology Annual Meeting, Missoula, Montana. June.

White, M.D. 1998. Moderator for a panel discussion on salinity and surface elevation management options for the Salton Sea. Salton Sea Symposium II. La Quinta, California. January.

- White, M.D. 1995. Managing salinity and surface elevation at the Salton Sea, California. Presented at the American Society of Civil Engineers Annual Convention 95, San Diego, California. October.
- White, M.D. 1993. Morphological characteristics of threespined sticklebacks (*Gasterosteus aculeatus*) from the Sweetwater River, San Diego County, California. Presented at the American Fisheries Society Western Division Annual Conference, Sacramento, California. July.
- White, M.D. 1991. Horizontal distribution of zooplankton in relation to predation gradients. Presented at the Zooplankton Ecology Symposium, Lawrence University, Appleton, Wisconsin. August.
- Hurlbert, S.H. and M.D. White. 1991. Quality of statistical analyses in studies on the effects of invertebrate zooplanktivores. Presented at the Zooplankton Ecology Symposium, Lawrence University, Appleton, Wisconsin. August.
- White, M.D., T. Morrison, G. Orlob, H. Chang, and C. Nordby. 1991. An environmental assessment of the potential effects of live stream discharge of reclaimed water to the San Diego River. Presented at the Symposium on Water Supply and Water Reuse: 1991 and beyond. American Water Resources Association, San Diego, California. June.
- White, M.D. 1989. The role of vertebrate and invertebrate predation gradients in producing horizontal heterogeneity of zooplankton populations. Symposium on Intra-zooplankton Predation, University of Sao Paulo, Sao Carlos, Brasil. June.
- Hurlbert, S.H. and M.D. White. 1989. A review of the experimental intra-zooplankton predation literature with emphasis on experimental design and analysis. Symposium on Intra-zooplankton Predation, University of Sao Paulo, Sao Carlos, Brasil. June.
- White, M.D. 1989. Evidence for diel horizontal migrations of an invertebrate predator, *Mesocyclops edax*. Southern California Academy of Sciences Annual Meeting, Thousand Oaks, California. May.
- White, M.D. 1988. Predation-induced horizontal zooplankton gradients. Ecology Supplement 69(2) pg. 340. Ecological Society of America Annual Meeting, Davis, California. August.

**INVITED LECTURES AND TEACHING**

July 2004. Guest lecturer in the joint Masters in Public Administration Program at San Diego State University and Universidad Autónoma de Baja California. Topics: the San Diego Multiple Species Conservation Program and Transboundary conservation planning.

January 2004. The Binational Expedition to the Sierra la Giganta, Baja California Sur: a limnologist's perspective. Presented to the San Diego State University Ecology and Evolutionary Biology Program Seminar Series.

September 2003. Presentation to Antelope Valley Chapter of the Sierra Club. Topic: Conservation significance of Tejon Ranch.

March 2001. Guest lecturer in Ecology of the Colorado River Delta, San Diego State University. Topics: Colorado River law, river operations, and the Multiple Species Conservation Program.

Fall Semester 2000. Instructor - Environmental Policy and Regulation (Biology 538) – San Diego State University. Curriculum covered aquatic and wetland ecology, jurisdictional wetland determinations, Clean Water Act, CWA section 404 permitting, California Fish and Game Code, California Regional Water Quality Control Plans, California Environmental Quality Act, National Environmental Policy Act, Fish and Wildlife Coordination Act, Federal Endangered Species Act, California Endangered Species Act, Habitat Conservation Plans, local governmental ordinances and regulations, and included presentations by environmental non-governmental organizations.

November 2000. Guest lecturer in Conservation Ecology, San Diego State University Department of Biology. Topic: Conservation planning in practice.

January 2000. Invited speaker at the Strategic Planning Education Seminar of the Coalition for the Sonoran Desert Protection Plan. Topic: Use of science in habitat conservation planning.

October 1999. Guest lecturer for the San Diego State University Department of Biology Graduate Student Seminar Series. Topic: Habitat Conservation Planning on the Lower Colorado River.

March 1999. Guest lecturer in Ecology of the Colorado River Delta, San Diego State University Department of Biology. Topic: Lower Colorado River Multi-Species Conservation Program.

February 1997. Guest lecturer in Topics in Toxicology, San Diego State University Graduate School of Public Health. Topic: Ecological Risk Assessment.

March 1996. Guest lecturer in Topics in Toxicology, San Diego State University Graduate School of Public Health. Topic: Ecological Risk Assessment.

April 1995. Reviewed manuscripts for the “Ecological Risk Assessment” conference Society of Environmental Toxicology and Chemistry (SETAC) Special Publication.

March 1995. Guest lecturer in Topics in Toxicology, San Diego State University Graduate School of Public Health. Topic: Ecological Risk Assessment.

April 1994. Guest lecturer in Topics in Toxicology, San Diego State University Graduate School of Public Health. Topic: Ecological Risk Assessment.

Spring Semester 1992. Environmental Assessment (Environmental Studies 105) – University of San Diego. Curriculum covered general ecological principals, regional ecology, California Environmental Quality Act/National Environmental Policy Act, Clean Water Act, Rivers and Harbors Act, Endangered Species Act, local government ordinances and policies, and biological impact assessment issues and methodologies.

February 1990. Guest lecturer in Experimental Design, San Diego State University Department of Biology. Topic: Data Transformations.

April 1988. Guest lecturer in Experimental Design at San Diego State University. Topic: Split-plot and Repeated Measures Designs.

March 1988. Guest lecturer in Limnology, San Diego State University. Topic: Physical Limnology.

April 1986. Guest lecturer in Limnology, San Diego State University. Topic: Benthic Ecology.