

The Proposed Plan and Modified Redesign Alternative Fire Protection Plans (FPPs), which follow the attached qualifications, were prepared by Dudek fire protection planners with input and review provided by various agencies and independent consultants. The qualifications of the preparers are identified below, followed by the professional biographies for each individual.

FPP Preparer:

DUDEK

- Michael Huff – Fire Protection Planner, Dudek Manager of Forestry and Fire Protection

- Scott Eckardt – Forester, Fire Behavior Analyst, GIS Analyst

Michael Huff – Senior Project Manager

Michael Huff is a senior project manager within Dudek's Urban Forestry/Fire Protection Planning team with over 17 years' professional experience as a natural resources planner specializing in management of community-wide and project-specific fire protection plans (FPPs), wildland-urban interface (WUI) fire management plans, wildfire hazard reduction projects, California Environmental Quality Act (CEQA) supporting technical documents, Oak Woodland impact and mitigation plans, urban and community forest management plans, forest and tree inventories, impact analysis studies, and tree hazard evaluations.

Mr. Huff possesses considerable project issue resolution experience and focuses on working within the regulations to provide creative, cost-saving solutions to his clients.

PROJECT EXPERIENCE

On-Call Fire Plan Review/3rd Party Consultant, Orange County Fire Authority, Orange County, California. Provides as-needed review of fuel modification plans and provides special studies regarding alternative materials and methods for the Orange County Fire Authority. To date, Dudek has provided review and comment of fire behavior modeling and proposed fuel modification and structural hardening for a large, master planned community in southern Orange County. Mr. Huff was also involved with research and preparation of a report on the efficacy of utilizing water cannons as an alternative for full fuel modification width.

FPP Third-Party Review, Rancho Cielo Shelter-in-Place Community, Rancho Santa Fe Fire Protection District, Rancho Santa Fe, California. Provided third party review of an existing FPP for the Cielo community. The existing plan was outdated and required updating according to new codes and new industry findings. Dudek confirmed fire behavior modeling results and provided updated language throughout the procedural manual which is distributed to Cielo homeowners.

FPP, Bella Vista Residential Development, Encinitas Fire Department, Encinitas, California. Prepared an FPP providing "same practical effect" justification for reduced fuel modification width on this ridge top project in Encinitas. Sensitive biological habitat constrained the possible disturbance area. Mr. Huff interfaced regularly with the Fire Marshal, including on-site meetings to discuss the results of fire behavior modeling and the proposed measures to offset fuel modification. The FPP was approved by the fire department and enabled construction of two additional luxury homes that would not have been possible otherwise.

Fuel Modification Zone Analysis and Fuel Management Program Development, Various Developers, Orange County, California. Managed various fuel modification plan projects for a residential development in Orange County. Field assessments of existing vegetation types and fuel loads were followed by fuel model input and scenario outputs. In addition, Mr. Huff managed the preparation of conceptual and precise fuel modification plans meeting Orange County Fire Authority guidelines.

EDUCATION

Northern Arizona University
BS, Forest Management, 1992

CERTIFICATIONS

San Diego County Department
of Planning and Land Use
(DPLU) – Approved Fire
Protection Planner

Laguna Beach Fire Department
– Approved Fire Protection
Planner

Certified Arborist, International
Society of Arboriculture (ISA)
No. WE-4276A

Certified Forester, Society of
American Foresters No. 1268

PROFESSIONAL AFFILIATIONS

Member, National Fire
Protection Association –
International (NFPA)

Member, California Fire Chief's
Association – Fire Prevention
Officers

Speaker/Trainer, Annual Fire
Prevention Officer's Institute

California Fire Chief's
Association, Fire Prevention
Officers Wildland Urban
Interface Committee

On-Call Fire Consulting, Laguna Beach Fire Department, Laguna Beach, California. Provides as-needed consulting to the Laguna Beach Fire Department. Among tasks requested are site fire risk assessments, vegetation hazard assessments, shelter-in-place assessments, red flag warning action plans, and fuel reduction monitoring and inspections.

West Coyote Hills Fire Protection Plan and Assessment, Chevron, Fullerton, California. Manages the preparation of an FPP for a 500-acre, 1,600-unit planned community in Fullerton. The project includes WUI and based on the fire behavior assessments and analysis on the site, proposed reduced fuel modification in areas that include reduced fire intensity. The net result of the proposed fuel modification zones is a reduction in native habitat impacts with fire behavior modeling backed justifications for the reduced impacts.

Fuel Modification Zone Analysis and Fuel Management Program Development, Various Developers, Orange County, California. Assisted a wildland fire ecologist on several residential development projects in Orange County. Field assessments of existing vegetation types and fuel loads were followed by fuel model input and scenario outputs. Fuel management programs that justified deviations from the Orange County Fire Authority standards were provided, along with agency coordination and meeting attendance.

Onyx Ridge Residential Development, Latitude 33, Rancho Santa Fe, California. Prepared a shelter-in-place FPP for this residential development project in Rancho Santa Fe. The project included development of nine residential units on a ridgetop with one access. Mitigation measures were integrated into the fire protection plan to compensate for the access issue. Mr. Huff interfaced regularly with the Rancho Santa Fe Fire Protection District and the client through project approval.

Camp Expansion FPP, Salvation Army, Ramona, California. Managed and prepared a FPP for this 600-acre project site. The Salvation Army proposes facility expansion to include several new structures, including large multi-purpose facilities. The FPP outlines several customized mitigation measures for the site to compensate for the sole access identified as a key project issue. The project included FlamMap fire behavior modeling, site assessment, code review and application, customized fuel modification zone development, structural fire protection system recommendations, and planned infrastructure summaries.

Fire Protection Plan, Cross Creek Residential Development, Fallbrook, California. Managed and prepared an FPP letter report, per San Diego County format, for a 10-unit residential project in the community of Fallbrook. The FPP supports the project's EIR as a technical appendix. Mr. Huff interfaced with the local fire protection district, with the client and the consulting team, and with the County of San Diego DPLU Fire Services through FPP approval.

Master Planned Community FPP, Tejon Ranch, Kern County. Assembled a fire protection planning team anchored by Dudek and Hunt Research on this 26,000-acre project site in southern California. Mr. Huff authored the report, integrated subconsultant input, provided presentations to fire department personnel, managed fire behavior modeling using FlamMap, and worked closely with project biologists to minimize ecological impacts while providing fire protection.

Master Planned Community FPP, Confidential Project, Southern California. Revised, updated, and re-wrote an existing FPP based on a revised project footprint and updated fire and building codes. The FPP includes documentation of all fire protection features that will be provided for this community. Key issues included road width reductions, fire response travel times, fuel modification plant palettes, and fire station construction.

Master Planned Community FPP, Confidential Project, Los Angeles County. Managed and authored an FPP for a 12,000-acre project site in Los Angeles County. The FPP provided scientific data to support recommended fire protection features, fuel modification widths, and fire station locations for this new community. The fire protection plan was not a requirement of the local fire department, but was prepared to provide a single source for the numerous fire protection related components of this large community.

Master Planned Community FPP, Yokohl Ranch, Tulare County, California. Prepared an FPP for this 36,000-acre project site near Visalia. The FPP summarizes the site's current conditions, fire history, overall risk of wildfire, anticipated fire behavior, and required and recommended fire protection features. The site includes grasslands, chaparral, oak woodlands, and mixed conifer forest fuel types.

Master Planned Community FPP, Merriam Mountains, NNP, Stonegate Merriam LLC, San Diego County, California. Served as the fire protection planning team coordinator, leading a 6-person team of experienced fire protection planners with over 150 years of combined experience. Re-wrote and augmented the existing FPP, provided FlamMap fire behavior modeling to represent the pre- and post-project fire behavior predictions, and assembled additional reviewers with statewide recognition who ultimately endorsed the FPP. The originally stalled FPP was approved by the county fire services section following this strategically implemented process.

FPP for Hotel Resort Community, Aliso Creek, Laguna Beach, California. Managed this project to prepare a comprehensive FPP for a resort community within a very high fire hazard severity zone in Laguna Beach. The FPP included justifications for reduced fuel modification zones based on environmentally sensitive habitat area constraints. The use of shelter-in-place and water cannon technology are included as alternative materials and methods for non-conformances.

Fuel Modification Plans, Restoration Area FPP, Newhall Land, Santa Clarita, California. Provided support on this project which included preparation of conceptual and precise fuel modification plans for proposed residential development. The project also included assessment of a proposed sensitive species restoration site and pre-plans for fire department response to minimize damage to the restoration area.

FPP, Residential Development, Malibu, California. Managed and provided oversight and quality assurance/quality control (QA/QC) for two FPPs in the City of Malibu. The FPPs provided a single source technical appendices of the project's EIR where all fire protection related information was summarized. The FPP's addressed structural ignition, water availability requirements, sprinkler requirements, roads/fire access, and fuel modification.

Post-Burn Oak Tree Evaluations, Mountain Park Development Site, Anaheim, California. Participated in this study of a large development site following the Sierra Fire in Orange County. Many of the site's oak trees were damaged by the wildfire and Dudek conducted a post-burn analysis, documenting oaks that were killed, those that were moderately damaged, and those that were minimally damaged. Dudek provided recommendations for tree management and restoration.

Post-Burn Oak Tree Assessments, Proposed Development Project, Trabuco Canyon, Orange County, California. Conducted a post-wildfire oak tree evaluation for approximately 200 oak trees occurring within a proposed project site. The oak trees were damaged by the Trabuco wildfire and varied from completely killed to minimally scorched. Dudek provided a

narrative and photographic summary of the site as well as recommendations for recovery of some of the trees and potential restoration for areas most severely damaged.

Post-Wildfire Landscape Assessments, AIG Insurance, Santa Barbara, Poway and Rancho Santa Fe, California. Mr. Huff managed several projects involving the post-wildfire landscape assessments and loss valuations. The projects included landscape inventory with GPS technology, assessments of plant material for damage level and anticipated recovery, and appraised loss value calculations.

PETCO Headquarters Wildfire Risk Assessment, PETCO, San Diego, California. Performed a site assessment of the headquarters' grounds to determine the potential wildfire vulnerability and provide recommendations to reduce the potential threat. Among the recommendations were active maintenance of unmaintained fuels on slopes, enforcement of smoking policies and use of butt receptacles, and regular maintenance of palm tree petticoats throughout the site.

Wildfire Hazard Assessment and Community Wildfire Protection Plan, Rancho Santa Fe Association and Fairbanks Ranch, Rancho Santa Fe, California. Provided assessment and recommendations for a 100-acre area that was previously burned in the Witch wildfire. Several homes were lost and that prompted the associations to assess the hazard and develop recommendations to reduce the hazard. Dudek conducted fire behavior modeling using Flammap to graphically display the priority areas and provided recommendations to reduce the hazard. Dudek also prepared a community wildfire protection plan for the area that was accepted by the FireSafe Council. This plan has been submitted with a grant application for fuel reduction funding.

FPP, Santa Barbara Botanic Garden, Santa Barbara, California. Managed the preparation of an FPP for the proposed botanic garden expansion. The FPP included site-specific fire behavior modeling, analysis of the option for on-site sheltering, and addressed all fire protection features that would be provided for the site's structures. Fuel modification was customized for this site based on the site's terrain and expected fire behavior.

Site Fire Hazard Inspections, Red Flag Warning Action Plan, and Fuel Modification Monitoring, Anneliese's School's Willowbrook Campus, Laguna Beach, California. At the request of the Laguna Beach Fire Department, Mr. Huff was retained to provide site-wide assessment of wildfire vulnerability. The site assessment included evaluations of vegetative fuels, structural composition, fire protection systems, combustible storage on site, ignition sources, and school location. Among other facets of this project, a red flag warning action plan was devised to close school during extreme fire weather days, an emergency preparedness plan was prepared to guide evacuations during various scenarios, and a structural retrofit timeline was put in place to increase the ignition resistance of the main administration building.

Wildfire Hazard Assessment, Camp Hi Hill, The Planning Center, Angeles National Forest, California. Managed this project assessing a Long Beach Unified School District Camp (Camp) situated amongst mixed conifer and hardwood forest in the Angeles National Forest. The Camp is used for elementary school student exposure to the forest and the unique learning opportunities it provides. Dudek conducted fuel loading analysis, fire behavior modeling using BehavePlus, structural conditions, hazard assessment, relocation/evacuation potential, and provided fuel reduction recommendations. In addition, Dudek advised the Camp on a last-resort option of sheltering in place on site with the implementation of structural hardening procedures.

Chapman University Community Forest Management Plan, Chapman University, Orange, California. Conducted tree inventory and mapping using GPS technology. Data derived from the tree inventory and interviews with maintenance staff were used to develop a comprehensive management plan. The management plan included maintenance practices, trim cycle analysis, pest and disease issues, watering, fertilizing, species diversity, and tree removal and replacement. Mr. Huff also provided a tree management software review and analysis of the tree inventory maintenance software used by Chapman University.

WUI Code Implementation Plan, Chula Vista Building Department, Chula Vista, California. Assembled a fire protection planning team, including Hunt Research and Scott Franklin Consulting, and managed this complex project which produced a document addressing fire behavior, structural and infrastructure fire code updates, and fuel reduction/vegetation management within NCCP Open Space Preserve areas. The City of Chula Vista Building Department sought an update of the WUI code based on the natural areas which occur throughout the City of Chula Vista. Much of the preserve is adjacent to older construction residences that were not provided adequate set-backs. Dudek worked with the City of Chula Vista building, planning, fire, recreation, and landscape architecture departments to resolve conflicts and result in a safer situation for existing and new development.

Preplan Map Conversion, Newport Beach Fire Department (Nbfd), Newport Beach, California. Managed a project which involved creation of a database for “pre-planning” fire management in high-priority structures for Nbfd. This project involved the creation of digital access, layout and fire equipment maps, and associated property data for high-priority structures, which include hospitals, schools, apartments, and other high-occupancy buildings. Important components of the maps include site and building access and egress points, utilities, ventilation, elevators, and types of construction. These maps are also linked with associated property data that includes alarm and sprinkler conditions, property owner information, inspection schedules, and special hazard conditions. In addition, the maps are geo-referenced for future incorporation into the City of Newport Beach’s GIS.

Community Wildfire Protection Plans, Santa Clara County FireSafe Council, Santa Clara County, California. Project manager for preparation of community wildfire protection plans for the Santa Clara County FireSafe Council. The plans focus on two areas, the east foothills area and the Croy fire area. Responsible for interfacing with approximately 20 different fire personnel, along with community groups throughout Santa Clara County. Managed and participated in site fuel assessments, fire behavior modeling, risk assessments, and preparation of several chapters of the final plan.

Structural Preplan Project, Nbfd, Newport Beach, California. Managed the digitization of hard copy pre-plan maps and the creation of electronic versions useful in on-board fire engine computers. Pre-plan information identified ingress and egress routes as well as floor-by-floor layouts and special fire-related apparatus.

Fuel Management in Wildland–Urban Interface (WUI) Areas, Nbfd, Newport Beach, California. Worked with the City of Newport Beach Fire Department to assess compliance with fuel modification zones in the WUI areas prone to wildfire. Vegetation type, spacing, and conditions were evaluated for compliance with established fuel modification zone ordinances. Oversaw database creation for use by Fire Chief and staff and managed a related project to inspect fuel modification zones annually.

Wildfire Hazard Reduction Project, Crest Canyon, City of Del Mar Fire Department, Del Mar, California. Managed this project for the Del Mar/Solana Beach Fire Department. The project included parcel by parcel inspection and assessment of 65 parcels within or directly adjacent Crest Canyon. Dudek recommended fuel reduction treatments for each parcel, prepared specifications for contractor bid, and monitored contractor work for this project. Dudek also provided community education and outreach due to highly emotional ties to flammable trees and vegetation requiring removal. In all, 134 tons of fuels were treated with all but 15 tons remaining on site as chipped ground cover.

Wildfire Hazard Reduction Project, Saxony Canyon and Lake Val Sereno, City of Encinitas Fire Department, Encinitas California. Dudek was contracted by the City of Encinitas Fire Department to perform a prioritization analysis and then focused fire hazard reduction projects in the City's WUI. Dudek performed lot-by-lot analysis for some 300 parcels, ran fire behavior models for each site, and prepared lot-by-lot treatment specifications. Dudek worked with in-house biologists and restoration specialists to ensure that fuel reduction work was being completed within governing regulations.

Fire Management Plan, Stephen's Kangaroo Rat Habitat Management Plan, Riverside Habitat Conservation Authority, Riverside, California. Managed the Fire Management Plan for this project which provided overall fire management goals within each delineated SKR management unit. The units were delineated based on existing habitat and long-term objectives for maintaining or improving habitat for SKR. Dudek researched and developed fire history analysis, vegetation type ecology and responses to wildfire fire behavior, specific response procedures for each management unit, and created response maps for responding fire

Hosp Grove WUI Fire Behavior and Recommendation Study, City of Carlsbad Fire Department, Carlsbad, California. Conducted a wildfire hazard evaluation of the Hosp Grove, an approximately 80-acre eucalyptus forest in an urban area of Carlsbad. Dudek conducted wildfire behavior modeling to model the potential for a crown fire and based on that outcome, addressed the adjacent home fuel modification requirements and provided a summary with graphical output illustrating our findings and recommendations.

Scott Eckardt, RPF – Project Manager, Licensed Forester

Scott Eckardt is a project manager and licensed forester with over 10 years' professional experience in the natural resource management field specializing in forest resource and fire management issues in open-space and wildland–urban interface (WUI) areas throughout California. Project experience includes assessment and inventory of woodlands and forests, monitoring of trees on development sites, assessment of fire and fuel hazard conditions, WUI inspections for local fire departments, preparation of fire protection plans and community wildfire protection plans (CWPPs), Global Positioning System (GPS) mapping, environmental monitoring, and preparation of assessment reports, oak woodland management and preservation plans, and California Environmental Quality Act (CEQA) technical documents. In addition, he routinely utilizes geographic information system (GIS) data and aerial photography in mapping, analysis of resource data, preparation of project plans, conducting project impact analyses, evaluating mitigation opportunities, and modeling fire behavior and wildfire hazard conditions. Mr. Eckardt previously worked for the California Department of Forestry and Fire Protection (Cal Fire) in South Lake Tahoe, where he conducted fuel reduction, vegetation thinning, and forest rehabilitation projects.

PROJECT EXPERIENCE

Community Wildfire Protection Plan (CWPP) Preparation, San Benito FireSafe Council, San Benito County, California. Serving as the project manager and preparing a county-wide CWPP consistent with the Healthy Forest Restoration Act. The CWPP identifies communities at risk from wildfire and integrates a community-based approach to project identification, fuel treatment, and community prioritization. The project also involves significant GIS-based mapping and analysis of fuel loads, as well as coordination between community stakeholders, including representatives from the Bureau of Land Management, Cal Fire, the National Park Service, and local county government. The CWPP will ultimately serve as a mechanism for acquiring federal funding for hazardous fuel reduction projects and been completed and signed by the San Benito County Board of Supervisors and Cal Fire.

WUI Fuel Hazard Assessment, City of Newport Beach, California. Responsible for inspecting, mapping, and documenting hazardous fuel conditions within the WUI protection area of the NBF. This is an ongoing annual project entering its tenth year, which involves determining property compliance with City of Newport Beach fuel management codes. Existing native and non-native vegetation conditions—including species, density, and continuity—are evaluated based on currently adopted fire codes, and prescriptions are made for required corrective actions. Field mapping efforts are enhanced by utilization of GIS, digital aerial photography, and GPS technology to capture site-specific resource data. Data is also prepared for integration into the city's GIS by linking field condition descriptions with geographic reference information, allowing access to relevant site information. Follow-up inspections are also conducted as a part of the annual inspection cycle to verify whether fuel reduction efforts have or have not been completed.

EDUCATION

California State University Long Beach
MA, Geography, 2006

California Polytechnic State University,
San Luis Obispo (Cal Poly)
BS, Forestry and Natural Resources
Management, 1998

CERTIFICATIONS

Registered Professional Forester (RPF),
License No. 2835 (exp. 7/1/2011)

International Society of Arboriculture
(ISA) Certified Arborist, Permit No.
WE-5914A (exp. 12/31/2010)

PROFESSIONAL AFFILIATIONS

Society of American Foresters
ISA

Cal Poly Forestry and Natural
Resources Management Department
Advisory Council, Chair

FPP for Tejon Mountain Village, DMB Associates, Lebec, California. Served as a technical expert, performed fuel loading and vegetation distribution analyses, and performed GIS-based fire behavior modeling in support of the FPP for the Tejon Mountain Village EIR. Detailed vegetation, topographic, and climate data were collected or retrieved and processed in developing GIS-based data files for inclusion in FlamMap fire behavior modeling efforts for the FPP. The resulting data were incorporated into the FPP and were critical in determining appropriate defensible space setback distances for proposed project improvements. Further, the fire behavior modeling results were critical in determining appropriate fire protection standards for buildings to be included as a component of the project. The project was approved by the Kern County Board of Supervisors.

Emergency Fire Response Plan for the Newhall Spineflower Conservation Areas, Newhall Land and Farming Company, Santa Clarita, California. Served as the project manager and prepared a memorandum identifying and defining appropriate fire response and suppression techniques within San Fernando Valley spineflower (*Chorizanthe parryi* var. *fernandina*) preserve areas located on portions of the Newhall Ranch. Proposed development adjacent to spineflower preserves necessitated a proactive management strategy for maintaining spineflower populations while considering the public safety implications resulting from potential wildfire and associated suppression efforts. The memorandum provided wildfire response and suppression recommendations to serve as a component of the overall spineflower preserve management efforts and is to be utilized by the County of Los Angeles Fire Department during suppression efforts.

Fire Department Response Modeling for the Lytle Creek Subdivision, Hunt Research Corporation, Rialto, California. Served as the project manager and developed GIS-based fire department response models for the Lytle Creek Subdivision in Rialto, California. Working closely with Hunt Research Corporation, an analysis of the travel time response coverage potential for existing and proposed fire station locations was conducted to determine coverage gaps and the percentage of the proposed subdivision that could be reached under current fire department response standards. Additionally, the coverage models helped to effectively place a new fire station. The analysis was conducted using Network Analyst tools within GIS software, and the output data included time (minutes) and distance (miles) totals from existing and planned station locations to the proposed project site.

Fire Department Response Modeling for the Carrari Ranch Subdivision, Hunt Research Corporation, Rancho Cucamonga, California. Served as the project manager and developed GIS-based fire department response models for the Carrari Ranch Subdivision in Rancho Cucamonga, California. The project involved an analysis of the travel time response coverage potential for four existing and one proposed fire station location and was conducted to determine coverage gaps and the percentage of the proposed subdivision that could be reached under current fire department response standards. The coverage models also helped to effectively place a new fire station within the City of Rancho Cucamonga. The analysis was conducted using Network Analyst tools within GIS software, and the output data included time (minutes) and distance (miles) totals from existing and planned stations to the proposed project site.

Fire Protection Plan (FPP) for the Hyatt Regency Newport Beach, Government Solutions, Newport Beach, California. Served as the project manager and prepared an FPP for the Hyatt Regency Newport Beach redevelopment project. The FPP addressed existing wildfire risk and developed a system of fire protection features that combined structural enhancement and customized fuel modification. The FPP will serve as an implementation plan during the preparation of final project construction documents and was developed in coordination with the Newport Beach Fire Department (Nbfd). The project was approved by the Newport Beach City Council.

Darwin Property Fuel Management Plan, Vista Unified School District, Oceanside, California. Served as the project manager and developed the Fuel Management Plan (FMP) for the Darwin Property. This plan outlined appropriate fuel treatment and maintenance standards to reduce overall wildfire hazard adjacent to the Darwin open space preserve and meet the vegetation clearance and hazard reduction requirements set by the City of Oceanside Fire Department (OFD). WUI fuel hazards were evaluated and mapped, and prescriptions were developed in consultation with project biologists with the intent to minimize risk to adjacent residences while minimizing or avoiding impacts to sensitive vegetation communities. The plan was approved by the OFD.

Conceptual FPP for Camp Hi Hill, The Planning Center, Angeles National Forest, California. Served as a technical analyst and fire behavior modeling/GIS expert for the Camp Hi Hill project located within the Angeles National Forest near Pasadena, California. The project involved developing an FPP associated with re-permitting for an outdoor education facility maintained by the Long Beach Unified School District. Project tasks included fuel loading assessments, fuels mapping, GIS analysis, and fire behavior modeling, which were used to inform the development of structural hardening, evacuation, and fuel treatment recommendations for the camp.

WUI Code Implementation Plan, City of Chula Vista, California. Served as a technical specialist and conducted field hazard and risk evaluations and prepared fire behavior models and GIS mapping supporting an analysis of the City of Chula Vista's adopted WUI Code. As a component of this project, Mr. Eckardt generated a GIS overlay analysis to locate potential high fire hazard areas within the city. ArcGIS Spatial Analyst tools were used in analyzing GIS inputs, including slope, aspect, elevation, vegetation type, vegetation age, and fire history. In addition, sensitive species data, open-space boundaries, and defensible space limits were incorporated into GIS analysis to prioritize sites for potential fuel reduction efforts adjacent to existing development.

Technical Consulting and Plan Check Services, Orange County Fire Authority, Orange County, California. Served as the project manager and a third-party technical consultant for the Orange County Fire Authority (OCFA). Project tasks included third-party review of proposed fuel modification plans and formulation of recommendations for plan revisions to provide for improved fire protection capabilities. Additionally, one task involved the preparation of a technical memorandum addressing the issues and constraints associated with passive and active fire protection systems for homes in WUI areas of Orange County.

CWPP Preparation, Monterey FireSafe Council, Monterey County, California. Served as the project manager and completed a county-wide CWPP for Monterey County. This planning-level document identified communities at risk from wildfire and relied on significant public involvement in developing fuel treatment options and refining the WUI boundary for Monterey County. Significant GIS-based mapping and analysis tools were used to evaluate fuel loads, hazard areas, and potential fuel treatment locations.

CWPP Assistance, Santa Clara County FireSafe Council, Santa Clara County, California. This project involved assisting the Santa Clara County FireSafe Council in preparation of two CWPPs by providing technical expertise for fire hazard reduction planning. CWPPs are planning documents that prioritize fire hazard reduction projects by identifying physical hazards and involving necessary stakeholders in addressing such hazards. Tasks included compilation of GIS data and development of fire behavior models, development of field inspection criteria, and field evaluations of vegetative fuel conditions.

Crest Canyon Wildfire Hazard Reduction Project, City of Del Mar, California. Served as a technical expert and conducted an assessment of existing fuel hazard conditions along the WUI adjacent to Crest Canyon in the City of Del Mar. Project tasks included field assessments and detailed fuel hazard mapping, GIS-based fire behavior modeling, GIS data analysis and mapping, and the development of prescriptions for reducing fuel loads within the WUI. Further, fuel reduction contractor specifications were prepared and the selected contractor was monitored for the duration of the project. The overall project goal was to reduce wildfire hazard and increase defensible space through on-the-ground rating of existing conditions, high-level modeling and analysis, and generation of justifications for conducting fuel-reduction projects. Project was implemented and completed with a successful reduction in hazardous fuels in the WUI.

Wildfire Hazard Reduction Project, City of Encinitas Fire Department, Encinitas, California. Served as a technical expert and conducted detailed GIS mapping and field documentation of wildfire hazards in the Saxony Canyon and Val Sereno areas in the City of Encinitas. The project involved compilation and analysis of available spatial data and conducting fuel loading and hazard analysis inspections in the WUI in the city. The resulting data was synthesized and lot-specific fuel treatment prescriptions developed in order to reduce wildfire hazards within the city. Project data was ultimately used by the city to apply for grant funding for project implementation.

Fuel Modification Zone Assessment, Nbfd, Newport Beach, California. This project involved assessing and documenting fire hazard conditions within existing fuel modification zones in an area that was to be annexed by the City of Newport Beach. Assessments involved evaluating existing vegetation conditions, using GPS and GIS in field mapping, data analysis, and data presentation efforts. Site conditions were evaluated based on existing adopted fire and fuel modification zone guidelines, and prescriptions were made for corrective treatments. Data was prepared in the form of tables and maps that linked field condition descriptions with geographic reference information, allowing the Nbfd to access relevant site and hazard information. This information was then used in successfully bringing many properties into compliance with existing fire codes.

Stephens' Kangaroo Rat Fire Management Plan, Riverside Habitat Conservation Authority, Riverside, California. Served as a technical expert and assisted in the development of the fire response and fuel management components of the habitat management plan. The project goal was to detail fire response and fuel management protocols aimed at maintaining or improving overall habitat for Stephens' kangaroo rat (*Dipodomys stephensi*). Extensive GIS mapping and fire behavior analysis was completed to determine appropriate response efforts by reserve management unit and identify potential hazards, access, and site constraints. An analysis of fire history, vegetation dynamics, and post-fire vegetative response was conducted in developing management strategies for the preserve.

Mountain Park Post-Burn Oak Woodland Assessment, Irvine Community Development Company, Anaheim Hills, California. Served as a technical specialist for a post-burn evaluation of oak trees within the proposed Mountain Park residential development site in Anaheim Hills, California. This project involved assessing individual coast live oak trees and larger stands of oaks following the 2006 Sierra Fire. Individual trees were assessed for scorching levels, canopy damage, and cambium damage based on U.S. Forest Service standards. Stands of trees were classified based on damage extent and mortality rates, and recommendations were made for promoting stand recovery.