Session IV

Policy Evolution and Futuring

Chair: Neil Sugihara

Strategic Holistic Integrated Planning for the Future: Fire Protection in the Urban/ Rural/Wildland Interface (URWIN)[1]

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Abstract

Wildland fire protection in the United States has evolved from predominantly protecting natural resources values to protecting values of the urban-wildland interface. Providing fire protection in this "unnatural" ecosystem has become more complex. Wildland fire suppression costs have escalated dramatically in recent years, yet the area of wildlands is decreasing. A strategic evaluation is made of the correlation of population growth, rising wildland fire protection costs, and roles and responsibilities of fire protection providers.

Introduction

Wildfire knows no jurisdictional boundary, but fire and land-use planning is often accomplished on an ownership basis. Wildfire suppression costs and population growth in the United States are rising exponentially. Urban-wildland interface area is increasing while the area of wildlands decrease. Although the area of wildlands is declining, fire protection costs on these lands are climbing rapidly.

Society's attraction to "living in nature," as opposed to "living with nature," impacts the quality of fire protection. A shift in historical roles and responsibilities for fire protection suggests a corresponding shift of fire protection costs. Fire protection in its broadest sense includes wildland and structural types of suppression operations; fire protection also encompasses presuppression fire planning and mitigation aspects.

This paper presents an empirical, strategic assessment of some dichotomies that have developed in fire protection of the urban/ rural/ wildland interface (URWIN) over the past century; it also focuses on a sense of integrated, visionary fire protection planning for the future.

URWIN as an Ecosystem

An ecosystem is an ecological community, and its physical environment functions as a unit, whether it is "natural" (no human impacts) or "unnatural" (including the human element). Randomly implanting people and their structures on the landscape will modify the previous ecosystem. If the environment continues to function as a unit, including the human element, then another ecosystem has been created. This "unnatural" ecosystem lives in harmony until a disturbance occurs.

This ecosystem is not unlike any "natural" ecosystem, such as the wildlands. In a natural ecosystem, we can look at a disturbance as nature's method to maintain biodiversity. Wildland, in terms of ecosystems, does not necessarily equate to a "natural environment." If one considers "natural" as unaltered by humans, then little area on this planet can be classified as natural, especially considering the effects of "acid rain" or "global warming." A determining factor to be a wildland is the lack of structures. Hence, Federal public lands and other lands administratively protected from structural encroachments are envisioned as comprising the bulk of the future wildlands. If we assume that all Federal public lands in the lower 48 United States will remain as wildlands, they would comprise about 30 percent of the land area.

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On the other hand, a city is an "unnatural" ecosystem. It also functions quite well until some type of unwanted event occurs. Depending on its magnitude, a disturbance in an urban environment is a disaster. For this discussion, an urban ecosystem is a structure-dominated landscape in which any vegetation alone is incapable of carrying a fire. As in all ecosystems, seldom is a distinct delineation evident traversing from one ecosystem to another, with a fringe area where two or more ecosystems interface. As a proportion of the total land base, the urban ecosystems comprise less than 5 percent of the 48 contiguous States.

The U.S. was settled by a population that moved into the landscape and converted natural ecosystems to unnatural ones. This alteration of the landscape took place with little concern for a problem developing. It seems rural development was an acceptable and safe means of settlement. If we consider the urban and wildland ecosystems to comprise about 5 and 30 percent of the U.S., respectively, then we can assume the rural, or URWIN, ecosystem encompasses the remaining 65 percent. However, the portion of this 65 percent that can be considered "rural" is elusive. For instance, the Conservation Reserve Program and the ripened grain fields have resulted in people not only "living in nature" but also "living in agriculture." Difficulty in controlling a conflagration in various types of vegetation, wildland, range, prairie or agricultural, is highly variable. But the fact that population density is increasing in all environments raises the complexity level of providing fire protection. We will consider any non-urban and non-wildland ecosystem as part of the URWIN.

URWINization Concept

The wildland, urban, and rural ecosystems and their respective protection have progressed and evolved in relative harmony over the past 100 years. What changes, then, are making the rural development process a problematic situation? The most evident factors are overall population growth and how rural development is occurring.

Population Growth in a Fixed Land Base

The U. S. population exceeded 200 million by 1960. The population has grown to 60 million more, about a 30 percent increase in less than 50 years. Projections are that our population will be over 325 million by 2025.

Our exponential population growth is happening with little planning on how or where to accommodate the growth. Legal, economic, social, and political forces are allowed to function independently until forced to react to some event. As populations increase, the threat from natural hazards to human well being will correspondingly increase. However, the U. S. is not unique; it is a global problem.

Rural Development

Migration from urban areas to rural environments for non-subsistence purposes in the U.S. began to rapidly increase after World War II. This population shift is frequently viewed in the same light as subsistence agricultural settlement of the U.S. during the past centuries. This is not the case. The only commonality is the direction of the migration: into the wildlands.

Early habitation of the wildlands was a form of "natural ruralization." By necessity and lack of technology, if not by design, wildlands were occupied by creating open areas within the wilderness. Because transportation of building materials was limited, vegetation (trees for logs, grasses for adobe) at the construction site was used, creating "clear" areas adjacent to the building site. Consequently, providing for shelter itself promoted "defensible space."

Early ruralization usually also required some form of sustenance. Clearing land for cultivation to provide for the basic food and clothing (cotton, wool, leather, etc.) needs further promoted open space and breaking up natural fuels.

Heating was primarily by wood or other natural vegetation, which also tended to keep the open space around any structures located in the wildlands.

Early settlers and Native-Americans were aware of wildfire dangers and maintained open space around their structures by design. Generally, perhaps not by design, but again by necessity, structure locations were close to water sources. These locations would naturally be in lowlands and areas of relatively high moisture. These types of habitable sites were less flammable and less likely to be consumed during natural conflagrations.

URWIN Development

In early subsistence rural development, settlers, homesteaders, farmers, and ranchers usually removed and consumed more of the immediate fuel load than they generated in order to eke out a living. In current non-subsistence rural development, the people move to rural areas for "aesthetic" reasons, including the desire to return to the "wild," seek solitude, and escape the urbanized culture. American society has adopted technology, economics, and opportunity to create a form of "artificial ruralization," or URWINization. In general, URWINization is a phenomenon diametrically opposed to settlement, homesteading, and other "natural ruralization" processes.

Locating dwellings near a source of water is no longer a necessity. Instead, structures are frequently located in the most severe fire prone sites, such as on hillsides, steep slopes, and arid locations for the sake of "scenic views." Technology permits us to access adequate water supplies for human needs in most any location. Maintaining adequate water needs for fire protection in these adverse sites has not always been considered.

Using on-site or nearby natural materials for construction at the building site is no longer necessary, or even promoted or economical. Instead of creating a fuel break or defensible space by using on-site materials, which is usually considered an adverse impact, building materials are imported to add to the fuel load on the site. The landscape may someday become an overloaded fuels site. For some reason the perception of society is that living in the "wilds" requires the structure to be tightly engulfed within the vegetative surroundings, which is in direct contrast to early wilderness settlement. Sometimes the vegetation is incorporated as part of the structure, such as a tree growing through a deck.

Technology permits us to add significant fuels to the site by transporting in vast amounts of construction materials, mainly in the form of wood and other flammable products. In subsistence rural development, large amounts of on-site fuels were consumed for heating and cooking, significantly mitigating fire hazards in earlier times. Today, we use an insignificant amount of vegetation in our desire to maintain a "wild" atmosphere. Technology allows us to conveniently transport huge containers of explosive heating and cooking materials, locate them close to our structures, and further add to the total fuel load and fire hazard of the "wilderness" environment.

Historically fuel wood for heating has been a major factor in disposal of small-diameter woody material in URWIN areas. Strict air-pollution regulations have almost eliminated this form of wood disposal in the very areas where it is most critical.

Clearing land to provide for food and clothing is no longer required to promote fire safe environments. Instead, we now build additional structures (grocery stores and malls) in our "natural" surroundings to replace the horses, cows, goats, and sheep that all helped to keep fuel loads in check and fire breaks around structures open. Providing for consumer food and clothing only adds to the overall hazard by injecting additional fuels in the environment through additional structures to provide for the basic need of the people inhabiting the nearby structures used for shelter.

URWINization of the landscape is not only happening in the classical, forested environments. Rural areas with scattered homesteads among the open fields are becoming infused with strip and cluster developments. At the same time, for the sake of soil conservation, we are paying agricultural landowners to revert croplands to grasslands. Many of these grasslands then become a major threat for fire control since use of any crop production is limited by law.

Given that wildlands will comprise 30 percent and urbanized areas another 5 percent of the total land area, the remaining 65 percent of the land mass in the U.S. requires fire protection in some form of URWINized environment. With 60 million additional folks in the near future, not only will private "wildlands" disappear, but much of the fringe areas of the public domain will be impacted. True wildlands will exist only in the heartlands of extensive public domain lands, primitive and wilderness areas, and extensive privately reserved "natural areas."

Historical Development of Fire Protection

Historically, roles and responsibilities in fire protection evolved as needs arose and technology improved. As urban areas developed, structural protection evolved from bucket brigades to manual pumps and hoses to sophisticated fire engines. Rural fire protection has evolved around small groups cooperating and uniting for the common good. Local folks financed staff and whatever fire equipment they could afford. Again, the primary purpose was to protect their homes and basis of subsistence.

Historically, local fire fighting agencies have been, and will continue to be, the front line of fire protection, whether it is in a rural or an urban ecosystem. Wherever our society chose to settle, a structural fire protection need was created. Combined, these urban and rural firefighters have primary responsibility to provide fire protection for nearly three-fourths of the area of the U.S. Fire protection for the urban ecosystem has evolved its own techniques, equipment, and organization for fire protection. It was driven by structural protection. Rural fire protection is provided through the network of volunteer fire departments. These fire departments have evolved mainly around structural protection techniques and concepts. Until recently, rural fire protection seemed to fulfill the necessary protection needs. However, in a relatively short time, we seem to have developed an "interface problem."

Local communities, fire districts, and counties are the lead agencies to accomplish and implement fire protection programs, natural hazard mitigation efforts, promote fire-wise measures, and establish and enforce defensible space standards on non-Federal lands within their respective jurisdictions. Only in recent years have strong inroads been made to improve fire mitigation efforts.

A state's fire protection role and responsibility has varied as widely as the number of states. Responsibilities vary from having no fire suppression responsibilities to those with full-fledged, statewide fire protection organizations. Some have little direct role in suppression efforts until the fire event has gone beyond the local capabilities.

Every state has a vital role in securing, administering, managing, and coordinating fire protection suppression, support, and mitigation training and equipment. The state organization has provided the lifeline from the federal level to getting resources to the grass roots level where projects are implemented. Wildland fire protection was born mainly to protect the vast natural resources of the Federal lands from devastating wildfires, especially in the western U.S. Around the beginning of the 20th century, when Federal reserve lands (National Parks, National Forests, etc.) first were set aside, these lands were quite isolated in the midst of other wildlands. With the bulk of wildlands in Federal jurisdiction and no other means available to provide fire protection, it became a federal responsibility. Over the past century, Federal land-management agencies have taken the lead in providing for wildland fire protection on Federal as well as non-Federal lands. A highly

sophisticated wildland fire protection organization has evolved with its own techniques and equipment designed for wildland protection.

The beginning of wildland fire protection is rooted in the five Federal land-management agencies under two Departments. The Forest Service is the only land management agency in the Department of Agriculture; the Bureau of Land Management, National Park Service, Fish and Wildlife Service, and Bureau of Indian Affairs are under the Department of Interior. The Federal Emergency Management Agency is not a land management agency; however, it is the lead agency directly under the President for all emergencies of disaster and catastrophic proportions.

The National Forest Systems branch of the Forest Service is charged with protecting and managing the National Forests and National Grasslands so they best demonstrate the sustainable multiple-use concept. The State and Private Forestry branch administers Federal technical and financial assistance to states for cooperative forestry, fire protection, forest health, and urban and community forestry programs for state and private landowners, cities, and communities through each State forestry organization. Forest and range land research comprises the third branch of the Forest Service.

As the "pool" of Federal public lands began to form at the turn of the century, the respective Federal agencies were created to administer these public trusts. Each Federal agency was congressionally mandated to administer and protect the lands under its jurisdiction in unique ways. These basic laws remain in effect today, causing each agency to develop its own unique management style and philosophy. All agencies have in common the need to protect natural resources of these wildlands from uncontrolled wildfire.

Out of this myriad of individual-agency fire protection programs was born one of the most sophisticated national organizations for wildfire suppression in the world. Although its primary role is to respond to support wildfire efforts where needed, the National Interagency Coordination Center (NICC) plays a vital role and link for assistance for any emergency, disaster, or catastrophe.

The NICC is the head of an intricate interagency national coordination and dispatching system, linked with geographical area coordination centers, which are in turn linked to locally based dispatch centers. The National Wildfire Coordinating Group (governing body of the NICC) trains and equips highly trained teams to support State and local fire organizations in fire emergencies. These too are used more frequently on non-fire emergencies in support of the Federal Emergency Management Agency responsibilities. A national fire equipment cache is also maintained at the NICC to support area, state and local fire requisitions for training and suppression.

The State of Fire Protection Today

Rural and wildland fire fighting agencies are experiencing fire events more complex. Fire occurrences on the landscape require faster initial attack, more resources, and a greater variety of resources. A fire occurrence in the URWIN usually requires a response by both wildland and structural resources until an on-site assessment and evaluation is made for potential threat to life and property.

Only in the hinterlands of the public-owned wildlands, where only protection of natural resources is at risk, can a fire event be truly a wildland fire. On the opposite side of the spectrum, pure structural fire fighting occurs only in the inner city, urban environment. Fringe areas of both wildland and urban ecosystems is an URWIN ecosystem.

With continuing population growth, the complexity of current events will elevate to a higher stage of occurrence. Each structure only adds additional fuels and risks to the URWIN ecosystem. Peripheral "wildlands" (such as urban parks, greenbelts, and urban National Forests) are subjected to higher risks as population densities continue to push along the edges of the public domain.

As these higher density URWIN areas have become more prevalent on the landscape, "simple" fires of the past now have become a high threat to life and property. Fires in the URWIN require an assorted array of wildland-structural fire fighting equipment. To minimize response times and assure proper equipment arrives at the scene, an initial response is often made by more units than necessary to ascertain sufficient resources. Until detection and dispatching systems become more sophisticated, this may be the most effective response, although perhaps not the most efficient.

URWIN fire fighting strategies carry a high price tag. If the fire fighting occurs on wildlands, although the cause is to protect structures off the wildlands, the tendency is to charge this to the wildland side of the ledger. Is it the proper role for wildland firefighters to respond to URWIN fires or do we need an elite fire fighting force with dual qualifications in both wildland and structure fires? Who should bear the costs for training, presuppression, and suppression? Who should be providing fire protection mitigation services for the URWIN ecosystem? How do we track the density of structures varying within diverse fuels of the "natural" vegetation that create a mosaic of extreme fuel conditions? These are some of the fire protection questions to consider as we enter the 21st century.

Positioning Fire Protection for the 21st Century

Federal Role and Responsibilities

In a time of crisis or major disaster, all Federal agencies may have a role or responsibility to support State and local entities as stated in the Federal Response Plan. We will focus on those agencies involved in the wildfire protection aspects.

Federal Emergency Management Agency (FEMA)

The Federal Emergency Management Agency (FEMA) provides national leadership and support to reduce the loss of life and property in major emergencies or disasters. FEMA is responsible for overall disaster management. Created by the Stafford Act of 1974, it has the leadership role for coordinating the 12 Emergency Support Functions inherent in the Federal Response Plan.

The Forest Service is one of numerous Federal agencies responsible for responding to emergencies through the FEMA. The Forest Service is responsible for addressing all wildland and structural fire fighting needs nationally in case of catastrophic/disaster conditions. It includes coordination of wildland, urban, and URWIN suppression activities. FEMA relies on the Forest Service to provide technical advice for fire suppression assistance to states when an event threatens to reach emergency/ disaster proportions.

Federal Land Management Agencies

Land management agencies play dual roles when it comes to fire protection. On the one hand, they are mandated to protect the natural resources they are chartered to administer and manage. On the other hand, by having wildland fire protection resources and expertise, they fulfill a supporting role to other fire fighting organizations of the State and local level, nationally in time of need.

Federal land-management agencies have one fire protection feature in common: they are all capable of wildland fire fighting, as opposed to structural fire fighting. This is an important distinction because, for example, bunker gear of a structural firefighter is not suitable in the wildland fire environment. Likewise, the yellow shirt with no breathing apparatus is not suitable in the hazardous smoke and heat environment of a structural fire. This often creates a dilemma in the URWIN. Federal fire-protection agencies will continue to bear the responsibility to provide for fire fighting support to assist states when their protection capability is exceeded, whether it is for wildland or URWIN.

Federal employees, as a part of the local community, can provide valuable expertise and a service if given the proper authorities to carry out non-fire duties, as well as fire protection responsibilities. The need for national resources at the local level to act as a catalyst permeates the full spectrum of emergency management. Having a workforce at the ground level is an opportunity few Federal agencies have available. However, it also brings with it certain responsibilities.

Numerous Federal land managing agencies have offices located in small rural communities. In an effort to become part of those communities, personnel deem it socially healthy, as well as expected by Federal agencies, to participate in all forms of community activities. This includes responding to requests for assistance during all types of events, incidents, and emergency.

Those same people in the field offices are responsible for management and protection of Federal lands. In most cases, those offices depend heavily on their local, county, and state neighbors to assist in activities on Federal lands. These activities include cooperative fire protection, cooperative law enforcement, hazardous materials incidents, search and rescue, etc. In society's view, this is the right thing to do, which is why most land managing agencies have good support within their local community.

Assistance given by local Federal and State employees to local communities is always in support of the local authority (county sheriff, emergency services coordinator) and only by their request. The Federal offices are not in the business, nor do they desire to be in charge, or have any sort of authority over local governments. Their authority rests entirely over the Federal lands they manage. In fire emergencies, this support is usually in the form of reciprocal or mutual aid assistance. Occasionally, fire may extend long enough to require reimbursement to a supporting party.

It is estimated that more than 90 percent of all events/ incidents, including wildfire, are handled by the capabilities of the local community. Less than 10 percent go beyond the local capability to the State or an emergency level. Fewer than 1 percent of all events go to a Presidential or FEMA disaster declaration.

It seems that Congress intended for State and local governments to prepare for local incidents, including obtaining insurance. It also seems that the Federal agencies were not intended to assist until those governments are beyond their capability to respond safely and effectively. It also appears that the law differentiates between complexities of incidents from major disasters to emergencies, both of which may have federal support.

State and Private Forestry

The State and Private Forestry (S&PF) Branch of the Forest Service connects the national fire protection program to non-federal ground through the state. The Forest Service also provides the linkages from the state to the Federal Emergency Management Agency to carry out Federal Response Plan and fire suppression assistance.

The charge of S&PF is to provide financial and technical assistance to state forestry organizations. This assistance is intended to enhance forestry practices, wood utilization, forest health, and fire protection on state and private lands in their respective states. The Cooperative Fire Protection program, as part of the S&PF, provides grants and technical assistance to support and enhance their fire protection programs; grant funds are also made available to states for organizing, training, and equipping rural fire departments. The Federal Excess Personal Property program makes federal excess equipment available on loan to State and local fire fighting agencies. This latter program has been an indispensable part of the rural fire protection program since its inception five decades ago.

Awareness of the URWIN situation was initiated over two decades ago at the national level by the Forest Service and National Fire Protection Association

(NFPA). Until then, NFPA was mainly concentrating on structural fire issues and the Federal agencies were concerned with wildland fire-prevention issues. A cooperative effort brought the structural and wildland issues to one table, with numerous conferences and awareness training sessions being developed. A niche will always remain for Federal agencies, land managing and administrative, to provide the national leadership and policies in the fire protection arena.

Opportunities exist for the Federal agencies to expand fire protection training, some of which is already being implemented. In the past, the National Wildfire Coordinating Group focussed heavily on the wildland fire suppression aspects of training. The Fire Administration, as part of FEMA, and the NFPA have led the cause for structural protection. Both wildland and structural training of these agencies has been mainly carried out by "on-site" training approaches. This is effective, but also costly. In some cases, it is necessary to have hands-on and on-site training, but not in all cases. Members of Volunteer Fire Departments (VFDs), especially, have neither time nor money to travel and attend distant training sessions. Yet, these folks are the backbone of the URWIN fire protection program. Technology is available to promote awareness and conduct training for fire protection far more efficiently and effectively through comprehensive distant-learning techniques. This type of effort can best be coordinated from the national level to assure standardization of training to meet national commitments.

Large-scale assessments are viewed at least at a river-basin watershed level. With the end of the "cold war" came relief of exceptionally tight security on satellite and other remote-sensing data. Greater efforts need to be made to use improved information in strategic-level planning at the national and state levels. Particularly at the national scale, integrated assessments of risk and hazards of all natural events should be accelerated. Fire protection assessments are envisioned as only one element in the strategic planning for all national disasters. The risk, hazard and value concept of the assessment process is as applicable to floods, tornadoes, hurricanes, earthquakes, blizzards, and volcanoes as it is to fire protection.

FEMA has the lead role to play in coordinating this type of effort. Federal land-management agencies have made inroads in large-scale assessments, as have some states. To be productive and effective in the future, national standards need to be developed to avoid a quiltwork pattern as lower level assessments are aggregated from the ground. FEMA, as the keeper of the Federal Response Plan and chief coordinator for disasters, could provide the basic framework for assessment processes and make remote-sensing and mapping data available to the other Plan participants. This would include state partners involved in fire protection and other emergency operations.

State Role and Responsibilities

Each state of the union has its own constitutional mandates. The role each state will or should play in providing fire protection within and outside its jurisdictional area will vary by each of the individual states. This does not preclude developing some basic roles and responsibilities of all states. An essential role for all states is to provide the avenue to implement congressional intent of Federal grants through the administrative organizations within each state. The National Association of State Foresters is a vital link to the national level for forming national policy and direction for fire protection.

Although we generally think of controlling land-use processes through local planning and enforcement agencies, the framework within which these agencies operate is dictated by State government. State government policies on industry, social welfare, etc. will affect the immigration and emigration of population and where it will take place. State culture and attitudes are formed on the basis of the governing philosophy. State governors and lawmakers dictate the roles their

administrative agencies will carry out in conjunction with URWIN fire protection. Major progress was made in helping define a state's role and responsibility in the URWIN by the policy development of the Western Governors Association.

A state's role in awareness and training is envisioned as more specific to the unique physiological, sociological, and climatic conditions prevalent within each state. URWIN fire protection awareness and training has tended to focus on the western forested states. Recent situations on Long Island, New York, and other eastern areas have manifested the needs for all states to have an awareness of the URWIN. Few states, if any, are expected to experience large-scale emigration. On the contrary, states can expect their URWIN conditions to intensify over time as populations shift and increase. Mobility of the workforce means awareness is a continuous need.

State involvement in fire protection training will vary considerably by state, depending on land ownership patterns. Some states have extensive holdings in public ownership while others have none. In any case, each state must provide the leadership and make available the necessary training resources to maintain adequate fire protection in the URWIN.

No state can be expected to meet all its fire protection needs all the time. It becomes incumbent for those states receiving Federal grants for fire protection to have fire fighting resources from that state be available for national or interstate fire emergencies. Internally, the inherent responsibility of every state is that it provide for the safety and fire protection of all citizens by supporting and training local fire fighting resources.

Fire is usually considered negatively, especially in the URWIN. Some of this perception stems from devastating wildland fires and fire prevention messages. Similar to a state's awareness and training responsibilities, it is paramount that the value of fire use through public education is promoted to a greater degree. It has been demonstrated that fire can be safely and ecologically applied in the URWIN ecosystem. Smoke management restrictions are often unique to each state; consequently, State and Federal fire protection and air quality agencies need to cooperate to avoid negative impacts of fire applications in the URWIN. Proper use of fire can help alleviate the disposal problem often encountered with small-diameter materials when performing fire-wise projects.

In any of the large-scale assessment processes, the resolution of the scale of assessment will dictate the strategic value. The statewide scale can be viewed as a mid-level strategic planning effort. By developing an aggregate of hazards, risks, and values, priority focal points for protection mitigation or suppression efforts can be identified. By overlaying a jurisdictional layer, areas are further delineated by responsibility. By introducing the dynamics of climate and weather for given fire behavior and geographical conditions, fire fighting resources can be pre-positioned to high fire danger areas, and requests for FEMA assistance can be facilitated. State forestry organizations or Offices of Emergency Management can alert and assist local entities in preparation for an event that may become a potential disaster.

An assessment process will facilitate the integration and coordination of other state emergency agencies and state forestry fire protection entities. Each state program area would continue to carry out their mandated responsibilities, but efficiency could be gained by integrating planning in a holistic, all-disaster perspective.

Comprehensive assessments can help focus risk/hazard mitigation efforts, identify geographical locations requiring fire protection priority, and evaluate areas for large-scale natural fire re-introduction efforts. An assessment of other types of occurrences, such as floods, earthquakes, etc. can be made. Once high-risk areas are determined for each type of occurrence, these risk overlays can be compiled to determine whether multiple risks and hazards exist on any given location of the landscape.

Community-based Fire Protection

Implementation of programs occurs on the ground. What actions are taken to provide for pre-incident preparations, mitigation, or incident response and recovery is dependent on the local elements. Funding and assistance provided by upper echelon entities are only effective if properly applied at the community level.

Land Use Planning and Enforcement

State and national planning and assessments must be capable of accommodating local planning efforts and situations. Project level planning has to have the capability of being aggregated upward. In other words, battle plans need to fit within the overall scheme of the fire-protection war effort. Local land-use and zoning regulations dictate the URWIN landscape. County commissioners, fire district directorships, and community leaders, all share the responsibility for determining priorities and shaping their local landscapes.

Fire Use and Education

Local educational institutions, homeowner associations, and environmental groups, have an important role in informing the public of the value of defensible space, fire-wise mitigation measures, and fire prevention. Local Federal and State employees and fire protection resources need to be incorporated into community planning. They need to be empowered to support "legally" other local emergency situations and mitigation efforts, as well as fire protection responsibilities.

Fire Protection "Assessments"

In contrast to landscape assessment planning or project-level planning, protection assessments are construed as "taxes." A basic premise is that where there are people, there should be a tax base. If a tax base exists, then it follows that a source of funding local protection infrastructure also exists. Local emphasis on levying assessments should not preclude continued state and Federal assistance for fire mitigation as well as protection.

Another basic premise is that Federal and State agencies are in a support role to the local level. With this in mind, logic would indicate that the local populace would be willing to pay for providing local fire protection needs. Only when an event exceeds the capability of the local infrastructure and only at the request of the local people will protection assistance from the state and federal level come into play. This assumes local state and federal folks are already committed as part of the local emergency response organization.

In an all-risk-planning concept, wildfire would be viewed no differently than other natural disturbance processes. Mitigation efforts are required to minimize human suffering and property loss when a disturbance event occurs. Seeking ways to avoid duplication of effort and redundancy of operations both internally and externally among all agencies would be progress toward saving taxpayer dollars at all levels.

Reviewing recent emergencies and disaster situations indicates society has a false expectation of the capabilities of emergency management responders, especially in catastrophic cases, such as hurricanes and earthquakes. People seem to expect the Calvary to arrive immediately after a destructive event. Regardless of the expertise and efforts of an emergency agency, if no infrastructure remains after a disaster, outside assistance may not be forthcoming for the initial 24-48 hours. To prevent false expectations, a locally based education program is paramount.

Most communities already have some type of emergency response system in place through Volunteer Fire Departments, Ambulance Services, and law enforcement units. What may be lacking is an organizational/communications structure for coping with all events or incident management.

Summary

Technology, education and awareness of fire use and protection, and sorting through the changing roles and responsibilities of all the stake-holders in the URWIN will permit "living with nature" in a relatively low-risk, catastrophic-safe URWIN ecosystem. URWINization has created an ecosystem in its own right; it may not be in harmonic balance when disturbed, but it is an ecosystem, nonetheless. Educating the public, overcoming traditionalism in the fire organization, and revamping fire training approaches are major areas of opportunity to accelerate protection mitigation efforts and apply fire use in the URWIN.

Intermeshing FEMA disaster/ emergency overhead team components, where feasible, with compatible fire incident overhead team positions may help achieve a better understanding of the function and role each agency. The intent is to develop a bridge to more efficient and cost effective disaster and emergency response teams to deal with all "catastrophic events."

The URWIN will not significantly change in area over the next half century. Public lands will remain the bastions of the wildlands, and the remaining privately held "wildlands" and URWIN ecosystem will become more densely structured, with some of the current URWIN ecosystem converted to an urban environment. URWIN fire protection costs can not be expected to decrease or level off in the future. As long as Federal wildland fire fighting agencies continue to absorb protection and suppression costs for indirect structure protection in the name of wildland fire protection, we can only expect a corresponding escalation in wildland protection cost. That increased cost will be born by the federal taxpayer. However, one could hope that long-term goals would prevail to give all taxpayers a fair chance.

As federal taxpayers, what portion of the total fire protection bill should be assigned to covering the presuppression and suppression costs associated with private lands? As state taxpayers, what fire protection costs are to be picked up on non-state lands in the interest of protecting private lands. As local citizens and private landowners, whether privately employed or local, State or Federal government employees, how much are we willing to pay and what are we willing to do to provide for a fire-safe URWIN ecosystem?

Mechanisms are already in place to shift the fire protection costs to whatever direction we choose. Responsibility for implementation of any program on the ground ultimately lies with the local citizenry. Transition from a federally funded basis to a state and local funded groundwork will surely be a time-consuming process. Basic elements are in place at all governmental levels for this transition to occur. All we need is the political will, fortitude, and foresight to make it happen.