The Politics of Fire and the Social Impacts of Fire Exclusion on the Klamath[1]

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Abstract

The exceptional biological diversity of the mid-Klamath River region of northern California has emerged in conjunction with sophisticated Karuk land management practices, including the regulation of the forest and fisheries through ceremony and the use of fire. Over three quarters of Karuk traditional food and cultural use species are enhanced by fire. Fire is also central to cultural and spiritual practices. Land management techniques since the 1900s have emphasized fire suppression and the "exclusion" of wildfire from the landscape. This paper uses data from interviews, surveys and other documents to describe the social impacts of fire exclusion for Karuk tribal members. The exclusion of fire from the ecosystem has a host of interrelated ecological and social impacts including impacts to cultural practice, political sovereignty, social relations, subsistence activities, and the mental and physical health of individual tribal members. In addition, Karuk tribal members are negatively impacted by the effects of catastrophic fires and intensive firefighting activities that in turn result from fire exclusion. Whereas existing literature has addressed ecological and social impacts of changing ecosystems as separate categories, the social, ecological and economic impacts of fire exclusion are here understood to be intrinsically linked.

> *Fire burn up old acorn that fall on ground. Old acorn on ground have lots worm; no burn old acorn, no burn old bark, old leaves, bugs and worms come more every year. Fire make new sprout for deer and elk to eat and kill lots brush so always have plenty open grass land for grass. No fire brush grow quick and after while choke out all grass and make too much shade, then grass get sour, no good for eat. No fire then too much leaf stay on ground. No grass can grow up. Too much dead leaf, ground get sour. Indian burn every year just same, so keep all ground clean, no bark, no dead leaf, no old wood on ground, no old wood on brush, so no bug can stay to eat leaf and no worm can stay to eat berry and acorn. Not much on ground to make hot fire so never hurt big trees, where fire*

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> *burn. Now White Man never burn; he pass law to stop all fire in forest and wild pasture… (Klamath River Jack, 1916[2])*

Introduction

The exceptional biological diversity of the mid Klamath River region of northern California has emerged in conjunction with sophisticated Karuk land management practices, including the regulation of the forest and fisheries through ceremony and the use of fire (Kimmerer & Lake, 2001; Lake, Tripp & Reed, 2010; Salter, 2003; Anderson, 2005; Anderson, 2006). Indeed, the species abundance and diversity of this region cannot be understood outside the broader tribal management activities that produced them (Agee & Skinner, 2005; Lake, 2013; Anderson, 2002; Lewis, 1993; Martin & Sapsis, 1992). Particular places in the landscape such as fishing sites, gathering sites and ceremonial grounds hold profound and unique importance for Karuk people. Karuk tribal members have responsibilities to tend to and care for the food and cultural use species they consider as relations. Amongst the activities that Karuk people are supposed to do as their part of the pact is to burn the forest. As Karuk Eco-Cultural Restoration Specialist and spiritual leader Bill Tripp describes,

> They used to roll logs off the top of Offield Mountain as part of the World Renewal Ceremony in September, right in the height of fire season so that whole mountain was in a condition to where it wouldn't burn hot. It would burn around to some rocky areas and go out. It would burn slow. Creep down the hill over a matter of days until it just finally went out. When it rained it would go out and that's what we wanted it to do.

Over three quarters of Karuk traditional food and cultural use species are enhanced by fire (Tripp, 2013; intergenerational traditional ecological knowledge; Norgaard, 2013). The practice of burning is also central to cultural, social and spiritual practices. In contrast, a central tenant of the US Forest Service land management techniques that have transformed the landscape since the 1920s has been the suppression and "exclusion" of wildfire. The exclusion of fire has led to radical ecological changes including high fuel loads, decreased habitat for large game such as elk and deer, reduction in the quantity and quality of acorns, and alteration of growth patterns of basketry materials such as hazel and willow, to name but a few examples. From a Karuk perspective, the exclusion of fire from the landscape creates a situation of denied access to traditional foods and spiritual practices, puts cultural identity at risk and infringes upon political sovereignty. On a more individual level, the altered forest conditions create social strain for the individuals who hold the responsibilities to tend to specific places and to provide food to the community for subsistence as well as ceremonial purposes.

Whereas existing literature has addressed ecological and social impacts of changing ecosystems as separate categories, the ecological, social, political, psychological and economic impacts of fire exclusion for the Karuk community are here understood to be fundamentally interconnected. As Karuk Cultural Biologist, dipnet fisherman and spiritual leader Ron Reed explains,

[2] 1916 letter to the California Fish and Game Commission by Klamath River Jack, Published 1916 in a Requa, California newspaper as "An Indian's View of Burning and a Reply."

> Without fire the landscape changes dramatically. And in that process the traditional foods that we need for a sustainable lifestyle become unavailable after a certain point. So what that does to the tribal community, the reason we are going back to that landscape is no longer there. So the spiritual connection to the landscape is altered significantly. When there is no food, when there is no food for regalia species, that we depend upon for food and fiber, when they aren't around because there is no food for them, then there is no reason to go there. When we don't go back to places that we are used to, accustomed to, part of our lifestyle is curtailed dramatically. So you have health consequences. Your mental aspect of life is severed from the spiritual relationship with the earth, with the Great Creator. So we're not getting the nutrition that we need, we're not getting the exercise that we need, and we're not replenishing the spiritual balance that creates harmony and diversity throughout the landscape.

This paper uses data from interviews, surveys and other documents to describe the social impacts of fire exclusion for Karuk tribal members. In addition, Karuk tribal members are negatively impacted by the effects of both catastrophic fire and the intensive firefighting activities that in turn result from fire exclusion. These impacts are also described.

Social Impacts of Environmental Disasters

Recent ecological literature has begun to address the impacts of fire exclusion on forest ecosystems in the American West (Keane et al., 2002; Collins et al., 2011). However, while there are many studies of the social impacts of wildfire on human communities, there are virtually no studies of the social impact of wildfire exclusion. There is an overlap in these issues in that fire exclusion leads to larger catastrophic wildfires over time.

Negative social impacts of wildfires include threats to human health (Fowler, 2003; Rittmaster et al., 2006) and important cultural or archaeological sites (Spennemann, 1999; Morton et al., 2003), emotional and psychological stress, and multiple community-level impacts to social resilience and community trust (e.g. Carroll et al., 2006; Kumagai, Carroll, & Cohn, 2004; Morton et al., 2003). In addition to the community impacts of acute wildfire, Carroll et al. describe negative impacts of firefighting activities on local communities, including loss of local control:

> Because disasters generally constitute disruptions that few local communities can deal with in the absence of outside help, they usually entail extra local assistance. Although this assistance is welcome and needed, outside entities can also be disruptive and contribute to conflict… The community now has two sources of disruption: The disaster event and the intrusion of outside entities into day-to-day life. (2006, p. 262)

Amongst other sources of conflict, Carroll and coauthors describe how the fact that fires are managed by rationalized bureaucratic agencies that "disembed or remove social relations from local contexts of interaction" (2006, p. 264). In other words, when these expert systems are created in remote times and places relative to the site of the fire, community knowledge, needs and values are easily overridden by a hierarchal decision-making structure based on outside expertise.

There is also a growing body of literature on the psychological impacts of disasters. Environmental disasters from oil spills or other contamination have led to higher rates of depression, post-traumatic stress disorder (PTSD) and other indications of mental impact (Picou & Hudson, 2010; Picou, Gill, & Cohen, 1997; Picou, 1998; Couch & Kroll-Smith, 1985). For instance, Michael Edelstein's 1988 study *Contaminated Communities: The Social and Psychological Effects of Residential Toxic Exposure* describes how residential toxic exposure negatively impacts multiple aspects of not only individual psychological experience, but also family, social and community relations. Fewer studies of disaster impacts address the unique issues for Native communities. Important work by Steven Picou and others on the impacts of the Exxon Valdez oil spill represents an important exception (e.g. Picou, Gill, & Cohen, 1997; Palinkas et al., 1993). The authors note that the spill precipitated "a mixture of emotions, including denial, outrage, sadness, numbness, hurt, confusion and grief" (Picou, Gill, & Cohen, 1997, p. 171). These authors describe how in addition to economic and subsistence impacts, the spill "shook the cultural foundation of Native life." Research has only begun to translate work on the psychological dimensions of disasters to wildfire events. For example, in their review of the social impacts of 10 recent wildfires, Morton et al. note that emotional impacts from property destruction and environmental damages from fires "are likely quite high" but understudied (2003, p. 38).

The notion that environmental degradation may have implications for tribal sovereignty has become an especially important theme within emerging scholarship on climate change (Abate & Kronk, 2013; Tsosie, 2013; Whyte, 2013). As culturally important species move or disappear with landscape change, tribal claims and jurisdictions over access to those species may be affected. Climate change is also rapidly reshaping the legal landscape, as new problems require new judicial rulings. And because there are still very few comprehensive federal laws applying to either the adaptation or mitigation of climate change, emerging regional, state and local efforts have emerged ad hoc. In the absence of an overarching legal framework Tribes face potential loss of acknowledgement of their jurisdiction if they are excluded from or cannot keep up with the multiple and rapidly changing dynamics between federal and local actors (Cordalis & Suagee, 2008).

The politics of fire exclusion have gained momentum in the context of climate change more generally. Climate change both increases the prevalence of catastrophic fires (and all their associated social and ecological impacts) and has brought these issues to the table with a new sense of immediacy. In the face of changing climate, many foresters Native and non-Native alike have turned to indigenous practices with renewed interest and optimism in the hope that they may provide a much needed path towards adaptation (Wildcat, 2009; Whyte, 2013; Lynn et al., 2013; Vinyeta & Lynn, 2013). This paper contributes to that literature by highlighting the immediate tribal benefits of such directions.

The Politics of Fire

Over the past several decades a combination of factors that likely include accumulation of biomass and fuels as a result of fire suppression, decreasing fire intervals, increasing scale and cost of fires (Miller et al., 2012), Native cultural resurgence (Nagel, 1997) and the presence of modern Indian nations as active players in natural resource management (Wilkinson, 2005), and the increased fire intensity resulting from climate change have converged to create contentious politics concerning fire management. Conflict over fire policy has produced significant media attention, generated textbooks, conferences and entire college-level courses.

If Karuk people feel strongly about fire exclusion, it is no wonder. At the same time that the "politics of fire" begins on the Klamath, the Karuk population went from about 2,700 people to about 800 people largely due to state-sponsored Indian extermination (McEvoy, 1986, p. 53; see also Norton, 1979; 2013). Karuk culture and lifeways have been under attack, first explicitly from state policies of genocide and overt forced assimilation and then implicitly through natural resource policies, coercive educational systems and ecological destruction itself. Over this time outright genocide, the lack of recognition of land occupancy and title, and the process of forced assimilation each facilitated changes in the use of fire and other land management practices and structure the present political and economic situation for Karuk people.

Explicit forced assimilation of Native people into the dominant culture occurred through boarding schools and other institutional processes. Like youth from tribes throughout Canada and the United States, Karuk children were separated from families at young ages and taken to Bureau of Indian Affairs boarding schools in Oregon and California for the specific purpose of assimilation. Karuk people were prevented from speaking their native language or practicing their native customs, and forced to eat a diet of "Western" foods. Karuk people still struggle today to recover economically, socially, politically and mentally from the devastation of these policies.

From a Karuk perspective ongoing forced assimilation continues today via ecological degradation and the criminalization of traditional cultural activities, amongst them traditional burning practices. While there is no overt policy designed to change how Karuk people view and use the land parallel to the ways that boarding schools explicitly enforced non-Native "white" behaviors onto Indian people, forced assimilation occurs because significant or "keystone" Karuk cultural practices such as the use of fire are illegal. Forced assimilation also happens when people fear retaliation and when Karuk food sources are so depleted that tribal people must buy store bought foods or eat government commodity foods instead. Here the assimilation in question is assimilation to non-Indian understandings, values and uses of the natural world.

Underlying the social impacts of fire exclusion described here is the fact that the practices and policies of the United States Forest Service (and other state and federal agencies) do not consider humans as part of the natural world, but instead are premised on humans as outside entities, managing nature. Therefore, as Karuk Director of the Department of Natural Resources Leaf Hillman describes,

> Every project plan, every regulation, rule of policy that the USFS adopts and implements is an overt act of hostility against the Karuk people and represents a continuation of the genocidal practices and policies of the US Government directed at the Karuk for the past 150 years. This is because every one of their acts, either by design or otherwise, has the effect of creating barriers between Karuks and their land.

In contrast to this notion of humans as separate from nature, Hillman references the Karuk Creation Story:

> At the beginning of time, only the spirit people roamed the earth. At the time of the great transformation, some of these spirit people were transformed into trees,

> birds, animals, fishes, rocks, fire and air—the sun, the moon, the stars… And some of these spirit people were transformed into human beings. From that day forward, Karuk People have continually recognized all of these spirit people as our relatives, our close relations. From this flows our responsibility to care for, cherish and honor this bond, and to always remember that this relationship is a reciprocal one: it is a sacred covenant. Our religion, our management practices and our day-to-day subsistence activities are inseparable. They are interrelated and a part of us. We, Karuk, cannot be separated from this place, from the natural world or nature… We are a part of nature and nature is a part of us. We are closely related.

Today the politics of wildland fire play out on the Klamath in three domains: (1) the desire of Native American tribes and other non-Native actors to use fire as a tool of landscape management; (2) concern over the impacts of catastrophic fire; and (3) community and ecological impacts from activities that take place at the time of firefighting (e.g. back burning, the creation of fire lines and the use of chemicals and fire retardants).

Data and Methods

The information presented here is compiled from three main sources: in-depth interviews with Karuk tribal members, responses from open-ended questions on the 2005 Karuk Health and Fish Consumption Survey, and archival material. Data from this project were collected in two phases. The original research was conducted from 2004 to 2006 in studies commissioned in connection with the relicensing of five dams on the Klamath River (see Norgaard, 2005). The purpose of the original research was to assess impacts of the dams and declining salmon populations on the health, culture and subsistence economy of the Karuk Tribe. At this time 18 in-depth interviews were used to gather detailed information from tribal members regarding health, diet, food access and consumption and economic conditions, and the 2005 Karuk Health and Fish Consumption Survey was distributed to adult tribal members living in the Aboriginal Territory. The survey contained 61 questions designed to evaluate the range of economic, health and cultural impacts for tribal members resulting from changes in the ecosystem. Open- and closed-ended questions on physical health and the consumption and harvesting of traditional foods were developed in response to interview data. The survey had a response rate of 38%, a total of 90 individuals.

Emphasis in the first phase of the study was on the changing conditions in the Klamath River, yet information concerning impacts from changing “upslope” or forest conditions was frequently included in interview responses, and several questions on the survey were specific to upslope conditions. In the second phase, from 2008 to 2013, an additional 20 interviews were conducted with Karuk tribal members living in the Aboriginal Territory focusing specifically on the social, cultural and health impacts of changing forest conditions. In both phases interviewees were selected via purposive sampling of key informants to identify a wide range of relevant concerns and experiences across Karuk Aboriginal Territory.

Social Impacts of Fire Exclusion

The ecology of the mid-Klamath region, including the distribution and abundance of species, has been fundamentally shaped by Karuk cultural practices, especially the use of fire. Skinner et al. (2006) write that “Native people of the Klamath Mountains used fire in many ways: (1) to

promote production of plants for food (e.g., acorns, berries, roots) and fiber (e.g., basket materials); (2) for ceremonial purposes; and (3) to improve hunting conditions" (p. 176). The Karuk Draft Management Plan notes that "[f]ire caused by natural and human ignitions affects the distribution, abundance, composition, structure and morphology of trees, shrubs, forbs, and grasses" (2010, p. 4). People burned to facilitate forest quality for food species like elk, deer, acorns, mushrooms and lilies. They burned for basketry materials such as hazel and willow, and also to keep open travel routes. Karuk people managed for their own foods and uses, but their activities created abundance that benefited other species on their own terms. Dr. Frank Lake, Karuk Descendant and USDA Forest Service research ecologist, describes what he was taught and learned of Karuk culture: "As a human, you have a caretaking responsibility. And so you managed areas to share acorns, to share mushrooms, to share berries to share grass seeds. Prairies, are you know, Indian potato root grounds."

Although the impacts of fire on the ecology of forest species are most immediately apparent, burning also affects inputs to riparian systems. The Karuk Draft Eco-Cultural Management Plan outlines how "[c]ertain trees and shrubs utilize water more than others, fire affects this relationship" (Fites et al., 2006). The distribution of forests, shrubs and grasslands affects the process of infiltration from precipitation and resultant levels of evaporation with how those plants utilized water (DeBano et al., 1998). The balance of water in and water out, leading to the amount of moisture in the soil and the quantity and quality of springs is influenced by fire (Biswell, 1999). Karuk fisheries biologist and spiritual leader Kenneth Brink describes this relationship:

> We did our fire management, which enabled to put more water into the tribs [tributaries], say like in a drought year, you take all your understory out, like all these blackberries and stuff would never be here. These alders would not be all big. There might be one or two big ones making a shade instead on all these little suckers. I mean, you didn't see the alder, and didn't see willow trees, you saw willow brush. I mean a lot of this foliage takes up a lot of water.

The exclusion of fire began as official policy in the early 1900s with the establishment of the US Forest Service as the official land manager of the region, and increased in intensity during the period following World War II. Studies of the Klamath mountain region note "two periods with distinctly different fire regimes: (1) the Native American period, which usually includes both the pre-historic and European settlement period, and (2) the fire suppression period" (Skinner et al., 2006, p. 176). As the authors also note,

> Over the 400 years prior to effective fire suppression, there are no comparable fire -free periods when large landscapes experienced decades without fires simultaneously across the bioregion (Agee 1991; Wills and Stuart 1994; Taylor and Skinner 1998, 2003; Stuart and Salazar 2000; Skinner 2003a, 2003b). Along with these changes in the fire regimes are changes in landscape vegetation patterns. Before fire suppression, fires of higher spatial complexity created openings of variable size within a matrix of forest that was generally more open than today (Taylor and Skinner 1998). This heterogeneous pattern has been replaced by a more homogenous pattern of smaller openings in a matrix of denser forests (Skinner 1995a). Thus, spatial complexity has been reduced (178-179).

Across the western United States a similar pattern occurs. As noted in the 2012 Final Report of Phase II of the Wildland Fire Cohesive Management Strategy,

> Practices such as pruning, burning and coppicing at regular intervals once contributed significantly to historic landscape resiliency and community livelihood. Access to abundant and quality hunting, fishing, and gathering areas as well as other traditional, ceremonial, or religious fire use factors have experienced significant decline following fire exclusion. (USDA, 2012, p. 30)

The Wildland Fire Cohesive Management Strategy affirms that in the face of continued fire exclusion, Native American cultural identity and traditional ecological knowledge are both at risk (2012, p. 30). Indeed Karuk culture, economy, spirituality and social relations have in turn been fundamentally impacted by the altered ecosystems on the Klamath. Take for example one ecological change such as the reduction of foraging habitat for elk as described in the passage above. This encroachment of brush means fewer opportunities for successful hunting, which in turn affects diet, food supply, the ability to engage in barter and trade, fewer social activities associated with hunting, the ability to properly conduct ceremonies and overall cultural identity. Individuals who are unable to provide for their families and communities experience role stress and threats to their identity as Karuk people, or as men when they are unable to fulfill prescribed roles as hunters and providers with fewer elk to hunt. On a larger scale the Karuk Tribe faces political challenges concerning the potential erosion of tribal sovereignty in the face of continued lack of recognition of land title and taking of resources by federal and state agencies. The following section will address each component of these fundamentally interconnected impacts.

Spiritual and Cultural Practice

The exclusion of fire from the landscape impacts an intricate series of Karuk cultural and spiritual practices. Important ceremonial fires are lit during the World Renewal ceremonies, and a burning log is rolled from Offield Mountain. Anthropological records from as early as 1949 describe burning on Offield Mountain and other sites. The description also includes a note indicating, “They have not functioned recently, because of the United States Forest Service prohibition against setting fires” (Kroeber et al., 1949, p. 8). Even now, as Bill Tripp notes, “The Forest Service wants us to get permits to build our sacred fires. I don’t see how that’s right in any sense of the word.” In addition to the prohibition of specific spiritual practices at the time of ceremonies, the exclusion of fire from the landscape affects the abundance of foods such as acorns and deer that are to be consumed during ceremonies.

Some sociologists have described Native people’s deeply embedded relationship with the natural world as a “subsistence” lifestyle. But spiritual relationships occur not just during ceremonies. As Ron Reed describes in the earlier quote, spiritual practice is embedded in activities of forest management. Thus, while subsistence is important, it is merely the end result of a cosmological equation that involves intricate practices of tending to and caring for the natural world that are the very expression of both spirituality and culture. These activities of “traditional management” inscribe responsibilities to both the human and ecological community. As Ron Reed explains, consuming traditional foods and participating in management activities are at the heart of Karuk culture and “being Indian”:

> You can give me all the acorns in the world, you can get me all the fish in the world, you can get me everything for me to be an Indian, but it will not be the same unless I'm going out and processing, going out and harvesting, gathering myself. I think that really needs to be put out in mainstream society, that it's not just a matter of what you eat. It's about the intricate values that are involved in harvesting these resources, how we manage for these resources and when.

Hunting, gathering, storing and preparing food are also an integral part of daily life. Traditional food holds a great deal of social meaning for the Karuk people. Activities associated with traditional foods serve as an important social "glue" by bringing people together to work, socialize and pass down values and information from one generation to the next. Food is central to some of the most serious social obligations for Karuk people—hospitality and caring for elders.

Not only foods, but numerous cultural use species are enhanced by burning. Northern California is home to the largest number of Native basketweavers in the state. Burning is directly necessary to produce the correct kinds of shoots for weaving, as well as to keep materials in adequate condition. Reed describes the holistic system of burning:

> You have deer meat, elk and a lot of times associated with those acorn groves are riparian plants such as hazel, mock orange or other foods and fibers, materials in there that prefer fire. The use of those materials is dependent upon those prescribed burns. So when you don't have those prescribed burns it affects all that in a reciprocal manner. It's a holistic process where one impact has a rippling effect throughout the landscape. We can only have that for a certain amount of time before the place becomes a desert without cultural burns, because the plants are no longer soft and the shoots are no longer food, instead they become these intermediate stages where they are just taking up light and water and tinder for catastrophic fire. So it has an impact not only on the species we are talking about, but how you harvest and manage and hunt those species as well.

Cultural practices such as weaving are impacted when materials are not available due to lack of burning. As Karuk basketweaver Marge Houston describes,

> The materials aren't available. Hazel has to be burned two years prior to picking. And there is no way. I know there was a lady in Weitchpec, that they burned their property every year, or every so many years. And it was just covered in hazel. And they would invite grandma and mom down, when they got done picking, you can come down and glean the patch.

As described above, the Karuk cultural and spiritual practices that are now being eroded by the exclusion of fire from the landscape have been under direct attack since at least the 1850s. Karuk people experience denied access to these cultural activities on this continuum of forced assimilation and genocide.

Fire Suppression and Political Sovereignty

Denied access to cultural practices of burning is an issue of political sovereignty. While the US Forest Service and other agencies claim the authority to make natural resource regulations, the Karuk people themselves do not recognize their jurisdiction due to the fact that lands were never ceded by treaty or otherwise, and therefore remain under the sovereign authority and jurisdiction of the Tribe. This jurisdiction is based upon the fact that Karuk people have performed the practices of traditional management including fishing, hunting, tending, gathering, burning and more on their Aboriginal Territory since time immemorial. Karuk people never ceded title to this Aboriginal Territory. Treaties signed in 1851 and 1852 were never ratified by the US Congress; instead Karuk people have maintained a continued presence on the land conducting cultural and land management activities (Heizer, 1972; Norton, 2013). As Karuk Tribe Director of Natural Resources Leaf Hillman notes,

> The very foundation underpinning the United States' claim to sovereign authority and jurisdiction over the Karuk lands and resources is premised on a legal fiction. This legal fiction has its origins in Manifest Destiny and the doctrine of discovery, whereby Karuk sovereign authority was necessarily diminished when the first European "discoverers" laid eyes on the continent.

In contrast, the Karuk Tribe claims jurisdiction over their membership, lands and territory as specified in the Karuk Constitution. However, the US Forest Service, California Department of Fish and Wildlife, Cal-Fire and other state and federal land management agencies do not recognize Karuk territorial jurisdiction, or do so only partially. The continued interference of the Forest Service and other agencies in Karuk traditional management including the activities of burning, tending, hunting and gathering described above threaten political sovereignty for Karuk people because they interfere with the Tribe's ability to continue the cultural practices necessary to maintain this legal standing. Continued fire suppression damages the ecological functions and diminishes the availability of and access to cultural use species. Similarly, because fire suppression as well as firefighting activities interfere with the ability of members of the Karuk Tribe to perform their cultural practices, these activities hold the potential to erode the Karuk Tribe's sovereignty over tribal lands and cultural resources. As Hillman states,

> These so-called land or resource management agencies, be they federal or state, refuse to acknowledge or respect the legitimate territorial boundaries of the Karuk Tribe. Agencies are simply an extension or arm of the governments they serve—in this instance, the United States of America and the State of California. As such, to acknowledge or recognize the territorial boundaries of the Karuk Tribe would be tantamount to an explicit admission that the continued occupation and rule by the United States is illegal and illegitimate.

He goes on to say the following:

> Make no mistake, the ugly reality that we, the Karuk People, face every day is that we live in the Occupied Territory of the Karuk Tribe—and that occupation is brutally repressive by nature. Every expression or assertion of Karuk Sovereignty

over their Territory necessarily represents a diminishment of both federal and state sovereignty—and vice versa.

Social Relations and Subsistence Economy

Early anthropological accounts described Karuk people as amongst the wealthiest in the state. Today Karuk people are amongst the hungriest and poorest people in the state. The percentage of families living in poverty in Karuk Aboriginal Territory is nearly three times greater than that of the United States as a whole. This dramatic reversal in economic circumstances is the direct result of the systematic state-sponsored disruptions of Karuk culture, including the longstanding traditional Karuk land management practices of enhancing the forest with fire.

The non-Indian "Western" capitalist economy that has emerged around the world classifies wealth in terms of dollars. Fire exclusion was implemented on the Klamath along the same time that this monetary economy achieved dominance. It is difficult therefore to know exactly what (if any) Karuk monetary economic uses of the forest would have been occurring today had the landscape not been modified by fire exclusion. Instead, this section will first note that fire suppression has profoundly disrupted the existing Karuk economic system, and second, that the extraction of monetary wealth from the region by non-Native people has occurred via the same management practices that have transformed the landscape. Native management practices that were oriented around species complexity and long-term sustainability were forcibly replaced by extractive management activities that were geared towards the withdrawal of commodities (gold, conifer trees, fish). These commodities became the basis of monetary wealth for non-Native people. Laws were implemented by the state of California and the federal government specifically to achieve this transfer of wealth to non-Native settlers in the region. Thus, while we know that Karuk people were wealthy prior to European invasion, that poverty in the Karuk community is now very high and that the land management policies enforced upon Karuk ancestral territory were the mechanism for a transfer of wealth, we cannot describe specific dollar impacts to the Karuk Tribe to the changing forest landscape. Karuk poverty is not inevitable, rather it has been the result of a series of events through which traditional Karuk management practices have been interrupted, wealth from the land has been transferred to non-Indian hands and the environment has been degraded. And the exclusion of fire from the landscape continues to be instrumental to this economic reorganization. While this change in economic systems complicates discussions of economic impacts from the exclusion of fire for members of the Karuk Tribe in dollar figures, such impacts would surely be large if they could be measured.

We can however examine the impacts of fire exclusion to the Karuk subsistence economy. Karuk use of fire in the ecosystem has been a critical activity underpinning this subsistence economy, which in turn gave individuals and families food, social capital, access to trade networks, and enhanced social networks and forming a type of social "glue" for relationships between families, elders and youth across the Karuk community. Much of this subsistence economic activity, including gathering acorns, mushrooms, berries and basketry materials, as well as burning, is now either impacted by the exclusion of fire, outright illegal, or regulated by the Forest Service and other agencies in ways that limit or prohibit Karuk access.

The forces of altered ecological conditions, responsibilities to tribal law, economic necessities, cultural practice and contested political status all come together in a vicious convergence for individuals. As spiritual leader and Director of the Karuk Tribe Department of Natural Resources Leaf Hillman puts it,

> In order to maintain a traditional Karuk lifestyle today, you need to be an outlaw, a criminal, and you had better be a good one or you'll likely end up spending a great portion of your life in prison. The fact of the matter is that it is a criminal act to practice a traditional lifestyle and to maintain traditional cultural practices necessary to manage important food resources or even to practice our religion. If we as Karuk people obey the "laws of nature" and the mandates of our Creator, we are necessarily in violation of the white man's laws. It is a criminal act to be a Karuk Indian in the 21st century.

In the 2005 Karuk Health and Fish Consumption Survey tribal members were asked whether members of their household had been questioned or harassed by agency game wardens while gathering a variety of other cultural and subsistence items. Twelve percent reported such contacts while gathering basketry materials, and over 40% indicated harassment while gathering firewood (see Figure 1).

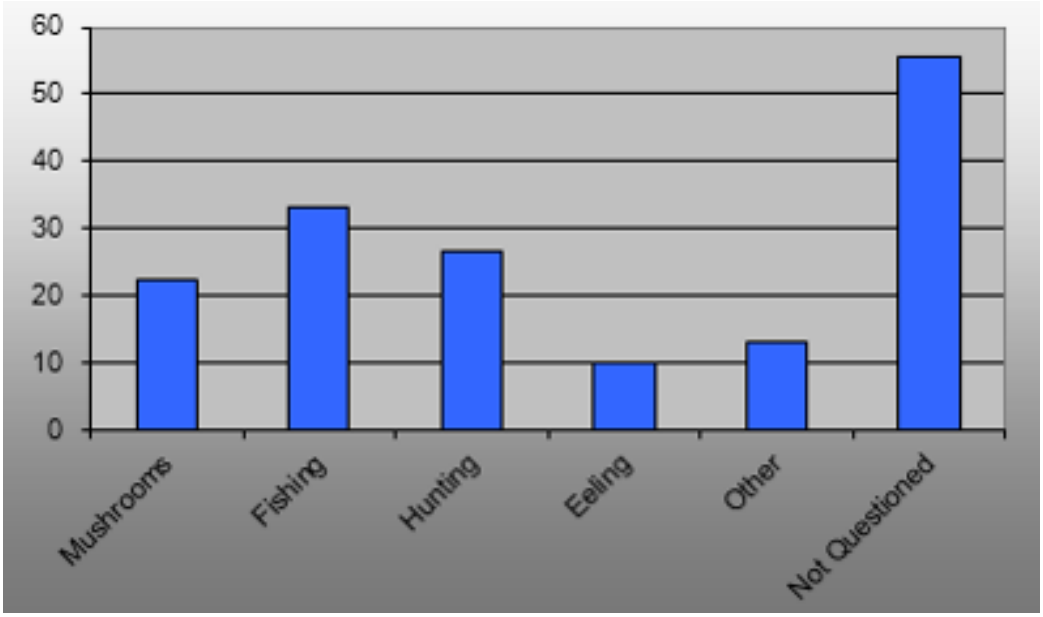

Figure 1. Percentage of households questioned/harassed by game wardens while gathering for subsistence or ceremonial purposes (Karuk Tribe, 2005).

Karuk Tribal member and spiritual leader Achviivich describes an example of the significant use of force that can be applied for minor infractions:

> Here was a tribal member, two tribal members right up there and they had them sprawled on the ground with a gun on their, on the back of their head because they didn't cut their mushrooms in half.

To be fined or have a family member imprisoned imposes a significant economic burden on families. This is a risk that many are unwilling or unable to take. Twenty percent of survey respondents reported that they had decreased their subsistence or ceremonial activities as a result of such contacts. Achviivich explains how in the face of degraded forest conditions due to

fire exclusion and possible harassment by law enforcement many people give up hunting and buy store bought foods instead:

> How much are society's laws preventing me from gathering? Well, 80%, 90%… Do I want to go out there and be hassled about it? Why? I go down to the damn store and buy that stuff a lot, you know. It is going to cost you more to go hunt, to go out into the woods and get it. It is not like it is readily available no more. It is not like you have a gathering spot like we used to have a gathering spot. You know, you used to have a gathering spot to gather something and you would go there and gather. Now you don't. Now you can't burn there. You can't burn there every year and every other year or however often you need to burn it in order to make your crop come up good. You can't do that. You can't burn. And you have to have a permit to get everything. Everything. You have to get a permit to get rocks off the goddamn river bar out here. Did you know that?

These descriptions from actions, ranging from changed ecological conditions in the face of fire exclusion to the outright illegality of Karuk practices, make clear the range of ways the reorganization of the Karuk subsistence economy has been both forcible and an extension of the process of forced assimilation described earlier. Forced assimilation happens as the above actions of the state deny Karuk people access to the land and food resources needed to sustain culture and livelihood. Forced assimilation happens even more overtly when for example game wardens arrest tribal members for fishing according to tribal custom rather than state regulation.

Forced assimilation reaches perhaps its most insidious form when the food species Karuk people would like to gather, hunt or fish for are simply not there. Without salmon and tan oak acorns, Karuk people are currently denied access to foods that represented upwards of 50% of their traditional diet. The absence of food and cultural use species in this overgrown forest undermines the subsistence economy. Food insecurity within the Karuk Tribe is evidenced by the fact that 42% of respondents living in the Klamath River area received some kind of food assistance, and one in five respondents use food from food assistance programs on a daily basis (Norgaard, 2005; 2007). With the decline in access to once abundant food sources such as deer, acorns, elk, salmon and mushrooms, a significant percentage of tribal members rely on commodity or store bought foods. As Karuk Tribal member Jesse Coon Goodwin explains,

> We can fish at the falls. Dipnet and that, you know, that's the only place we can fish really. But we're not able to go out and go hunting anymore, without getting in trouble for it or something, you know, so now we have to go to the store to buy our food and get different kind of foods that aren't sustainable for our bodies, like food that was made here for our people, you know? So a lot of it has changed that way…

The inability to access traditional food impacts the Karuk tribal members not only due to decreased nutritional content of specific foods, but results in an overall absence of food, leaving Karuk people with basic issues of food security. Recent US Department of Agriculture studies show that while roughly 85% of the US population is food secure, only 77% of Native Americans in the United States are food secure (Gordon & Oddo, 2012). Self-reported data from the Karuk Health and Fish Consumption Survey indicate that 20% of Karuk people

consume commodity foods and another 18% of those responding indicated that they would like to receive food assistance but do not qualify. Hunger and poor nutrition are bad for your health. As will be described in the next section, difficulty in meeting basic needs results in overwhelming physical and psychological stress.

Healthy Foods and Physical Health

If fire exclusion profoundly affects the availability of Karuk traditional foods, Karuk people in turn face significant health consequences as a result of denied access to many of these traditional foods (Norgaard, 2005). Health benefits of traditional foods include better nutrient density, the availability of key essential nutrients, physical activity during harvesting, lower food costs, the prevention of chronic disease by consumption of more nutritious food, and "multiple socio-cultural values and traditions that contribute to mental health and cultural morale" (Kuhnlein & Chan, 2000, p. 615; Cantrell, 2001). The loss of traditional food sources is now recognized as being directly responsible for a host of diet-related illnesses among Native Americans including diabetes, obesity, heart disease, tuberculosis, hypertension, kidney troubles and strokes (Joe & Young, 1994). Around the world when Native people move to a "Western" diet, rates of these diseases skyrocket. Traditional foods are higher in protein, iron, zinc, omega-3 fatty acids and other minerals and lower in saturated fats and sugar. While salmon and other riverine foods have been an important focus of study in terms of Karuk diet and health, there are at least 25 species of plants, animals and fungi that form part of the traditional Karuk diet to which Karuk people are currently denied or have only limited access. Figure 2 shows a few of the many important forest foods that are enhanced by frequent low-intensity fire.

Black Tail Deer	púufich	Odocoileus hemionus
Roosevelt Elk	íshyuux	Cervus occidentalis
Squirrel (Western Grey)	áxruuh	Sciurus griseus
Tan Oak	xunyêep	Lithocarups densiflorus
Dwarf Tan Oak	xunyêep	L. densiflora
Hazel	athithxuntápan	Corylus cornuta
White Oak	axvêep	Quercus garryanna
Canyon Oak	xanpútip	Q. chrysolepis

Figure 2. Some important Karuk forest foods that are enhanced by fire.

Furthermore, foods that were most central in the Karuk diet, providing the bulk of energy and protein—salmon and tan oak acorns—are amongst the missing elements. Identified health consequences of altered diet for the Karuk people include rates of Type II diabetes that are four times the US average. Rates of heart disease and hypertension also significantly exceed

national averages. The estimated diabetes rate for the Karuk Tribe is 21%, nearly four times the US average. The estimated rate of heart disease for the Karuk Tribe is 39.6%, three times the US average (Norgaard, 2005; 2007). A traditional diet, along with the exercise entailed in procuring it, is widely recognized as both the best prevention and the best treatments for such conditions.

Not only did a traditional diet prevent the onset of conditions such as obesity, diabetes, heart disease, kidney trouble and hypertension, the tasks of acquiring traditional food provided exercise that kept people in good physical condition. There are other relationships between physical health and access in the altered forest structure. As ecologist and Karuk Descendant Frank Lake describes a brushy understory creates significant dust,

> There is a related health issues there, and I had to explain this to the firefighters just recently [summer 2008]. When there is a big clear understory and a big acorn tree with the firs and madrones mixed around. Before, you didn't have that underbrush, that younger growth of the tan oak has this kind of dust on it. And it is particularly more so on the new sprouts, the new shoots and the new leaves. So as you are going through that tan oak understory, that thick brush, you are getting that dust in your nasal cavities and your eyes and your throat. So it is actually causing additional problems. Whereas if they could just clear the understory brush out, cut it down and pile burn or even broadcast, burn the understory, it would actually reduce that part of that tan oak dust being an irritant and a potential health problem that is associated with trying to go out there and collect.

Fire Exclusion and Mental Health

Just as physical health is embedded in both ecosystem health and cultural activities for Karuk people, so too is mental health. There are multiple important ways that present social and ecological conditions, including the inability for Karuk people to participate in traditional management negatively affects the mental health of individuals. Decades of research from sociology and psychology indicate that vital components to mental health and psychological well-being include positive sense of self-worth and self-efficacy, coherent meaning systems, contact with an intact natural environment, and sense of personal and cultural identity (Mirowsky & Ross, 1989; Thoits, 2010; Downey & Van Willigan, 2005). As Karuk tribal member Lisa Hillman remembers,

> When we were little, we spent a lot of time with my mom and my aunties gathering—say huckleberries. It was tough work, but we learned a lot and it was a time of family bonding. Those feelings were reiterated at mealtimes when we ate whatever it was that we gathered. Nowadays it is difficult to repeat those activities with my own children. That bond with family and with the landscape remains a fond memory, and it also makes me angry that those memories won't be a part of my own children's experience.

Mental health is negatively affected by physical health challenges, as well as social sources of stress caused by the absence of any of the above.

The reduced ability of Karuk people to participate in traditional management negatively affects both the mental health of individuals and generates a level of chronic community stress.

Chronic community stress occurs when long-lasting psychological stressors are present across a community of people (Gill & Picou, 1998). Such community stress is more than the sum of individual parts, as the disruption of many people's lives simultaneously affects community social structure and the maintenance of day-to-day activities that may create an overall sense of normlessness (Mirkowsky & Ross, 1986; 1989; Gill & Picou, 1998; Erikson, 1994). Karuk people experience chronic community stress in relation to the experiences of both fire suppression and exposure to frequent catastrophic fire events as will be described in the next section.

As described earlier, participation in fishing, burning, gathering and other aspects of traditional management hold immense personal and spiritual significance and are central to Karuk identity. When people are unable to carry out these practices it can create a powerful threat to an individual's sense of self. The loss of control in relation to cultural activities has a clear association with genocide, as described here by Karuk Tribal member and spiritual leader Achviivich:

> Our way of lives has been taken away from us. We can no longer gather the food that we gathered. We have pretty much lost the ability to gather those foods and to manage the land the way our ancestors managed the land.

Such experiences are not unlike what Downey and Van Willigen (2005) found in their work on how proximity to environmental contamination can generate a sense of personal powerlessness.

The exclusion of fire from the ecosystem can also be linked to accounts of role stress and role strain for Karuk people. As Mirowsky and Ross define, "role stress is a disjunction or inconsistency in the system of roles, so that normal obligations cannot be met… Role stress produces role strain, which is the frustrating sense of not being able to understand or meet the normal expectations of one's roles" (1989, p. 15). In addition to the more individualized threats to identify and sense of control mentioned above, Karuk people describe role strain due to the inability to fulfill responsibilities to the Creator, to particular species in the ecosystem, and to the human community. In the words of traditional dipnet fisherman and spiritual leader Kenneth Brink,

> Now we are being stripped of a lot of our duties as a Karuk person, as a traditional male, and that's just because of regulations… The new regulations they have, rules and regulations, keep us actually from living our traditional way of life… Our ceremonies have been, you know, stripping down because of regulations… Now we're only allowed to do certain things in our ceremonies, not allowed to do our traditional burns or nothing no more.

Traditional management refers to care for the environment, but managers have specific social and cultural responsibilities to their families, elders and the Karuk community as well. With the altered ecological condition of the forest, role strain also comes from the inability to fulfill obligations to the human community such as the ability to provide deer, acorns or other traditional foods for ceremonies, to provide elders in the community and to feed one's own family. Here again Kenneth Brink describes the angst in relation to not being able to carry out these responsibilities:

> A Karuk male if he was a traditional male, he'd be feeling like he was stripped of his tradition, you know, stripped of his way of life because he is no longer allowed to go out and get a deer to provide for his family or to go out and get more than two fish or something to provide for his family, or any of that picture there you know. And if you don't burn, if you don't get Morel mushrooms…and in that sense, we are being stripped of a lot of our duties as a Karuk person, and as a traditional male.

Note that this experience is tied in with the sense of oppression from the outside non-Indian agencies. This role strain has negative consequences for identity, personal pride and general mental wellbeing, as described here by Karuk traditional dipnet fisherman and spiritual leader Ron Reed:

> When you're not able to go upslope and go manage, you're not able to go up and reap the harvest of that management and when you're not able to go produce for your children and give things for each other for the wellbeing of life, then all of a sudden, that puts you in this little down feeling. You're down-casting yourself. I think that's where a lot of the people in Karuk Tribe are because of our inability to get to these resources that have been given to us by the Creator. We understand very much that we're a proud people. We're here for a reason, but a lot of us struggle with modern society, trying to figure out how do we integrate into modern society?

Thus at the individual level, Karuk people are observed to experience chronic stressors from threats to meaning systems, identity, role strain and powerlessness, each of which is directly related to the exclusion of fire from the landscape. At the collective level, the struggle to maintain culture in the face of adversity and an ongoing sense of genocide are chronic stressors on the community.

Social Impacts of Catastrophic Fire and Firefighting Activities

While smaller frequent burning of the landscape is essential for Karuk food and cultural use species, Reed describes how the ecological or social results of large very hot fires that have come as a result of fire suppression are mixed at best:

> It's not just one thing, but the whole range of landscape activities that were created by cultural burns. Without cultural burns, we will at some point cease to exist. When they don't have fire they go dormant. A lot of our fibers, a lot of the stuff we relied upon heavily back in the day are no longer available in a sustainable way. But in our cultural world it is just the opposite. The landscape is clean, there is food, there is water and there are prominent ways to the high country without all the overgrowth.

The exclusion of fire as a management tool allows high fuel loads to build up in the forest and near people's homes, in turn making the threat and reality of catastrophic fire significant. Catastrophic wildfires are in and of themselves disturbing events in which people may lose or fear the loss of their homes and important sites in the landscape, and normal home and work

routines are disrupted (Amacher et al., 2005; Weisshaupt et al., 2007). Large fires may on occasion have ecological benefits for Karuk foods and cultural use species. For example, in August 2013 large fires in the Karuk Aboriginal Territory were correlated with a drop in river temperatures and presumably were beneficial to adult and juvenile salmon because lowering water temperatures decreases risk of a disease outbreak. However, in the years since fire suppression has occurred in Karuk Aboriginal Territory, catastrophic fires have increased (Miller et al., 2012). Fear of catastrophic fires and the ecological impacts of resource damage when they occur are further negative effects of the exclusion of fire from the landscape.

When large fires occur, there are significant social impacts at the time of firefighting itself including additional damage to the important gathering sites due to firefighting tactics, physical health impacts of smoke, impacts to cultural and subsistence activities and an enormous mental strain from an awareness that an outside agency is exerting control over decision-making. If fire suppression produces an ongoing chronic source of negative impacts to Karuk lifeways, the activities that take place at the time of a fire produce acute social impacts. Noise and intrusion from the use of helicopters when ceremonies are underway and the use of "federal closures" that denies people access to public lands are a de facto form of martial law, especially when armed officers enforce closures by arresting people for trespassing on their own public lands.

Just as the general forest management policy of fire suppression emerged from a European sense of how the forest is valued, activities to fight fire also reflect the economic, political and cultural values of the dominant non-Native world. Decisions about what is to be protected and how to protect it including the use of back burning, the creation of fire lines and the use of chemicals and fire retardants have all created profound damage for the ecology of the region and for culturally important food species and gathering areas. One Karuk elder, Marge Houston, described how the Forest Service dropped fire retardant onto her prime acorn and mushroom gathering area, a site that was just 100-200 feet from her home:

> This summer there was a less than an acre fire here on the Indian allotment and what happened was the Forest Service came in after it was under control, they come in and did a Borate drop, or some fire retardant. They wanted to come down and do another one 'til we had to get out there and start screaming at them. And basically they said, "Well, we'll only do two drops." But you know there's some big issues there. Because first of all it was under control. Second, it was less than an acre of fire. And now we have a contaminated subsistence harvest area along with other culturally sensitive areas… They cut down my acorn trees. And they missed the fire to begin with… Sprayed it everywhere but on the fire. I couldn't even breathe for three days. All the oyster mushrooms that I got up here on this [fire] I cannot eat. 'Cause they come up and they're pink. Just like the chemical that they sprayed. I can't eat that. I'm not going to be able to eat a mushroom off that tree again. Damn.

Damage to the ecosystem, as well as to particular plants and animals can be particularly disturbing to Karuk people. As Brave Heart and DeBruyn note, "For American Indians, land, plants, and animal are considered sacred relatives, far beyond a concept of property. Their loss becomes a source of grief" (1998, p. 62). During the 2008 fires, Marge Houston was visibly upset due to the impacts on both people and animals of the larger fires:

> You know, it's [fire suppression] doing detrimental damage to each and every person who is breathing all this smoke. Whereas instead of a short time in the fall, now it is damn near all summer. And that's got to have some effect on people, it's got to have the shortage of game, some effect on that. Because you, these people, the fire is over here, they are back burning all around. What about those animals that are in the middle. Where do they go? No place but into the fire. They either die of the smoke inhalation or they eventually burn.

This awareness of ecosystem decline is another chronic stress for Karuk people. Both the existence of the fires and the experience of the fire response are events that signify and inscribe power relations of domination by an outside non-Native presence. As illustrated in the words of Marge Houston, Karuk people often have a keen understanding of relationship between fire suppression policy and catastrophic fire. In this case however there is an increased stress due to the awareness that the ecosystem is declining because it is being regulated by outside agencies, and because the failure to allow Karuk participation in management is an aspect of cultural genocide. As Mirowsky and Ross describe, "People need to feel that they are effective forces in control of their own lives. The sense of control bolsters the will to think about problems and do something about the problem" (1989, p. 13). In contrast, Karuk people vividly described feelings of powerlessness in the face of institutional forces that are working against ecological health while simultaneously eroding people's control of their immediate social environment. Karuk Eco-Cultural Restoration Specialist and traditional practitioner Bill Tripp describes the devastating emotional impacts of trying to communicate Karuk perspective on fire and protect cultural resources in the face of Forest Service presence fighting the large fires of 2008:

> In my situation I find myself quite a few times just to the point of asking why am I even here trying to do this? I should just go and be happy somewhere. On these fires, every two weeks you are dealing with new people, and you're going over the same things, and you are trying to re-justify every decision that was made where you were barely able to hold onto protection of one little piece of something. And then you're losing a piece of that cause new people came 14 days later. And then you're losing another piece of that and another. And you spend your whole time going over everything that you just went over again, and again, and again. And losing a little bit every time. And it causes some serious mental anguish. At the end of 2008 I quit the fire probably three or four weeks before I should have. Because it was like, "I am done, I can't do it anymore." I went home and I sat in my chair and I didn't do much of anything but sit and stare at the wall and eat and sleep for about a month. Before I could even get myself to come back to work.

Finally, there is an added dimension to all of the above because the loss of control in relation to cultural activities has a clear association with genocide for many people. Witnessing the denial of Karuk efforts to enact cultural management, the destruction of catastrophic fire, the actions of non-Native fire crews back burning through stands of acorn trees that have been culturally important for generations, or the disruption of Karuk ceremonies with helicopter noise are associated with genocide in several ways. On the one hand, experiences of fire and

timber policy that are set according to non-Native values and philosophy are more generally associated with a long-felt awareness of Karuk culture and life under attack. As researchers note,

> American Indian people are faced with daily reminders of loss: reservation living, encroachment of Europeans on even their reservation lands, loss of language, loss and confusion regarding traditional religious practices, loss of traditional family systems, and loss of traditional healing practices. We believe that these daily reminders of ethnic cleansing coupled with persistent discrimination are the keys to understanding historical trauma among American Indian people. (Whitbeck et al., 2004, p. 121)

On the other hand, because denied access to management makes impossible the social and cultural practices described above, such actions are quite literally the present face of cultural genocide and forced assimilation. As Leaf Hillman describes,

> Every project plan, every regulation, rule or policy that the United States Forest Service adopts and implements is an overt act of hostility against the Karuk People and represents a continuation of the genocidal practices and policies of the US government directed at the Karuk for the past 150 years. This is because every one of their acts—either by design or otherwise—has the effect of creating barriers between Karuks and their land.

Conclusion

The exclusion of fire from the ecosystem has a host of interrelated ecological and social impacts for Karuk people including impacts to cultural and spiritual practice, political sovereignty, social relations, subsistence economic activities, and the mental and physical health of individuals. The notion that American Indian people would inevitably disappear was implicit in the discourse of Manifest Destiny that legitimated genocide during the 1800s. Still today the narrative that Native people are gone remains a pervasive and insidious force legitimating natural resource policies that profoundly damage Karuk life ways. The present discussion of the social impacts of fire exclusion is a case in point. Yet nothing could be further from the truth. In contrast, as they have recovered significant political and economic standing, Native American tribes across the United States including the Karuk have become increasingly involved in natural resource management. Tribes remain disadvantaged in these settings however due to insufficient understanding of their unique political status and cultural perspectives, the lack of acknowledgment of the violent history perpetuated against them through both genocide and forced assimilation, and a profound misunderstanding of how present day natural resource policies such as fire exclusion and multiple forms of denied access to traditional management continue the processes of genocide and forced assimilation today.

Acknowledgement of the social impacts faced by the Karuk Tribe in relation to fire exclusion, the ongoing threat of catastrophic fires, and the activities of firefighting themselves as described here is essential. This acknowledgement must occur formally in the National Environmental Policy Act (NEPA) process prior to forest management as required by law, through acknowledgement of Karuk jurisdiction as land managers at federal and state levels and in the development of wildfire plans and on the ground fire management.

Furthermore, in the face of increasing costs of firefighting, fire severity and decreasing fire intervals more effort has been paid in involving local communities as resources in fighting fires (Danks, 2001; Everett & Fuller, 2010). Local communities can play key roles in fire prevention and response. Local community involvement can also mitigate negative social impacts of fires by increasing community capacity. With their longstanding and sophisticated cultural practices, ties to the land, traditional ecological knowledge, political standing and increasing political and economic capacity, it is imperative that Karuk expertise and leadership in forest management be acknowledged not only as an issue of legal rights or social justice, but for the health and wellbeing of ecosystems and non-Native human communities alike, especially in the face of climate change.

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