

## Chapter 24

# Implications of Sense of Place and Place-Based Education for Ecological Integrity and Cultural Sustainability in Diverse Places

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### Introduction

Emotional and intellectual estrangement – or even the outright eviction – of people from places personally and culturally important to them is rampant in this time of anthropic sprawl, economic globalization, and cultural homogenization. Placelessness (Relph 1976) unmoors individuals, often with detrimental effects to self-identity and well-being. Mass displacement, typically to suit the economic or political purposes of others, removes aboriginal or historically resident populations, each of which possesses a diachronic collective memory of local environmental processes and cycles, hard-won expertise in how to dwell sustainably in a place, and usually the most vested interest in preserving that place. Contested places are the loci of past, ongoing, and potential future conflicts and displacements, which threaten ecological integrity (Nabhan 1997) and cultural sustainability (Cerneja 2000) around the globe.

Place-based education, explicitly situated in the learner's physical and cultural surroundings, has been invigorated as a means of "reclaiming the significance of the local in the global age" (Gruenewald and Smith 2008, p. xiii). This approach is now most often practiced by educators in stable and secure places within the mainstream of the developed world. However, place-based education whether offered formally in schools or informally through public outreach offers unique benefits for troubled communities in contested places, where ideas and opinions on the value and use of local spaces and resources diverge, conflict, and defy reconciliation. Such conflict may be catalyzed or compounded by people's misconceptions or lack of functional knowledge of the contested place, and these are exactly what place-based teaching and learning are intended to address. Refugees who have been resettled in a stable but foreign place can also be helped to bond with and live well in their temporary or permanent new home.

In the following, we begin with a summary of the nature of place and its relationship to place-based education, mediated by sense of place: a construct that synthesizes the human connections to place. We then review the evolution of place-based educational

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philosophy to show a progressively greater emphasis on how to dwell sustainably in places and thereby preserve their environmental and cultural viability. To illustrate potential applications of this philosophy to contested places, we offer examples of the human damage done by forced displacement of two indigenous groups in the southwest USA and in Malaysia, and then present the complex of issues surrounding an ongoing place-related dispute in a naturally and culturally diverse southwest US community. We conclude with a discussion of reasons why and ways that place-based education can be brought to bear on these and other disputes over richly meaningful places, in order to safeguard their ecological and cultural attributes.

## Place, Sense of Place, and Place-Based Education

We live in physical landscapes comprising landforms, water, air, and ecosystems. On this substrate, we have created cultural landscapes populated by *places*: spatial localities imbued with meaning by human experience (Tuan 1977), whether in situ or vicariously. Places are social constructions. Their meanings originate from the interplay of the natural attributes of the place, and all of the humanistic and scientific ways that people can sense and understand it (Casey 1996). For example, a place may be meaningful as a ceremonial site for an indigenous people or a home to an endangered species, or for its portrayal in a famous artwork, or for a deposit of an economically valuable resource. Simply naming a place gives it meaning. Place meanings become as diverse as all those who inhabit, visit, use, learn, value, preserve, or otherwise experience the place. In many places, different meanings coincide, sometimes come into conflict as local demographics change, and are renegotiated through discourse, scholarship, media, economics, and law. Anthropologist Keith Basso (1996) wrote that

places are as much a part of us as we are of them—yours, mine, and everyone else's—and senses of place partake complexly of both. And so, unavoidably, senses of places also partake of cultures, of shared bodies of "local knowledge" (the phrase is Clifford Geertz's) with which persons and whole communities render their places meaningful and endow them with social importance. (Basso 1996, p. xvi)

While making meaning in places, people frequently form emotional attachments to them. Such place attachments can vary in intensity from simple acknowledgment that a place exists to a willingness to make meaningful personal sacrifices in order to preserve or enhance the place (Relph 1976). The *sense of place*, as commonly characterized in the place-focused disciplines of geography, environmental psychology, and rural sociology (e.g., Brandenburg and Carroll 1995) is the combination of all meanings and attachments that an individual or community affixes to a place. Sense of place encapsulates the relationship of humans to places.

Places are dynamic; just as geologic and climatic processes modify the physical landscape, population and cultural changes alter the meanings and dimensions of a place, albeit at very different rates. Cultures and worldviews are often distinguished in part by their relationships to place: how geographically rooted they are (Orr 1992);

what roles the attributes of a place play in their lifeways, teachings, and history (Cajete 2000); how important place is to individual or group identity (Proshansky et al. 1983), and so on. Places may abide for centuries, like the pueblos of the southwest USA; metamorphose, as in the growth of the city of Phoenix, Arizona, atop Hohokam ruins; or weather away, like abandoned mining camps. Old place names may be forgotten and new ones bestowed. Place-making itself is the only constant in the cultural landscape.

But places are also part of the biological world, and humans are also attached to the living entities and lifelike processes in particular places. Biologist Edward O. Wilson argues in his *biophilia hypothesis* that humans are genetically predisposed to focus attention and bond to the other forms of life in their environments (Wilson 1984). While mainstream biology has a specific and limiting definition of what is living, some cultures view meteorological, hydrological, and geological phenomena as animate beings, life processes, persons, or consciousness; though possibly occurring at rates different from what humans can resolve. In such cultures, relationships among humans, fauna, flora, weather, and landforms may be described in kinship terms (McNeley 1987). These overlap with what may be termed a “geophilic” connection: influence of physiography on sense of place (Silko 1986).

*Place-based* (Elder 1998) or *place-conscious* education (Gruenewald 2003) situates teaching and learning in place by design. Ault (2008) describes it as the coherent integration of place and discipline, ranging from the use of place only as context, for example, in teaching disciplinary concepts, to wholesale reworking and melding of disciplinary cognitive agendas so that “place itself becomes the principal object of inquiry ... leading to the enhancement of self and connection to community” (Ault 2008, p. 631). Place-based education, while still far from a mainstream approach, is today practiced in a considerable variety of formal and informal settings. A number of these have been richly catalogued by Sobel (2004) and Gruenewald and Smith (2008), and on the websites PromiseOfPlace.org and PEECworks.org. Further, Orr (1992) and Gruenewald (2003) have identified a number of more traditional academic subjects and curricula appropriate for place-based synthesis.

Recently, stronger connections have been made between sense of place – previously of interest mostly to geographers, environmental psychologists, architects, and planners – and theory and practice of place-based education. Working in two geographically and socioculturally distinct settings, Semken (2005) and Lim and Calabrese Barton (2006) noted that students bring their own senses of place into any learning environment or activity, and recommended that these senses of place should be acknowledged and constructively leveraged by teacher and curriculum. Semken and Butler Freeman (2008) argued that enrichment of sense of place in the course of learning is a valid and assessable learning outcome of place-based education.

In summary, places are where we sense and connect to our natural and cultural surroundings, and sense of place is a construct that usefully describes this connection. Place-based education is situated in pedagogically fruitful places and leverages the senses of place of students and teachers. It is highly relevant to environmental ethics, conservation, ecological integrity, and cultural sustainability, because all of these are also situated in places.

## **Evolution of Place-Based Educational Philosophy Toward Sustainability**

Although the term “place-based education” was not used and may not have existed before the late 1990s (Elder 1998), the prosocial value of contextualizing learning in local physical and cultural environments has long been understood. Indigenous knowledge systems and philosophies of education have always been place-based: invested with culturally defined biophilic and geophilic place attachment, and informed by long-term observation of and reflection on natural processes and systems, phenology, animal behavior, and human history. Place-based Indigenous teachings serve to empower successive generations to thrive communally and self-sufficiently amid the climatic, hydrologic, and ecological patterns and cycles specific to their homelands (Kawagley and Barnhardt 1999).

In contrast, this philosophy appeared only sporadically, and each time briefly, throughout the early history of EuroAmerican formal education. In the first 2 decades of the nineteenth century, progressive Swiss educator Johann Heinrich Pestalozzi experimented with pedagogy we would today recognize as place-based (Hutchison 1998):

Through lessons in map and model-making. ... Pestalozzi pioneered the study of place in childhood by having his students explore [local] terrain and topography. (Hutchison 1998, p. 84)

In the USA, as compulsory public education for children was widely instituted in the middle-to-late nineteenth century, strongly influenced by a “Prussian model” of uniform, decontextualized curricula and teacher training (Cousin 1834), the educational philosopher John Dewey (1916) advocated instead for active, experiential learning situated in a child’s immediate social and physical surroundings. He named history and geography (both cultural and physical), disciplines fundamentally tied to place, as the most important studies in the curriculum (Dewey 1916). Dewey argued that the prevailing curricula and practices were, even then, overspecialized and largely irrelevant to children’s home and community life. Yet his perspective was not simply parochial; he viewed learning situated in place as “the natural starting point ... for moving out into the unknown, not an end in itself” (Dewey 1916, p. 212). But institutionalized schooling, with its emphasis on efficiency and compliance, functioned synergistically with the political and corporate workings of an increasingly industrial and consumerist society (Callahan 1964), so Dewey’s recommendations went mostly unheeded.

During the interval between the two World Wars, the idea of a “regional survey,” a grassroots movement to study and teach about nature in local environments, emerged from the earlier writings and subsequent passionate advocacy of Scottish biologist and urban planner Patrick Geddes (1904, 1905). The movement flourished only briefly in the 1920s and only in Great Britain and the new Soviet Union, in part probably because the curriculum was never well-defined and the concept was mostly of interest to academicians (Meller 1994). Two decades later, American

historian and critic Lewis Mumford, an adherent of Geddes, revived the concept of the regional survey in *Values for Survival* (Mumford 1946), a collection of essays strongly influenced by wartime events and the ascent of technology. Mumford believed that authentic synthesis of humanities and science was needed to provide a check on what he saw as the disproportionate social and political influence of the latter. He proffered Geddes's regional survey as

the backbone of a drastically revised method of study, in which every aspect of the sciences and the arts is ecologically related from the bottom up, in which they connect directly and constantly in the student's experience of his region and his community. (Mumford 1946, p. 151–152)

Mumford elaborated on two attributes of the regional survey that today are typically associated with place-based education (e.g., Gruenewald 2003): that its centered but outwardly expanding focus of attention mirrors a child's, and then a student's, developmentally increasing awareness of the surroundings; and that it situates the study of nature in the context of human interactions with nature. Mumford also recognized that the student's subjective relationships with local environments and communities were integral to the regional survey, presaging the role of sense of place in place-based teaching and learning (discussed below), although he probably had no conception of the term.

It is apparent that these proponents of what is now referred to as place-based education were motivated primarily by interests in child development and socialization. This is implicit acknowledgment of the indispensable role of places in forming human perceptive abilities and identity (Casey 1996). But whereas environmental consciousness has always been at the heart of Indigenous place-based teaching and learning (Cajete 2000), it did not likewise imbue mainstream writings on place-based models of education until after the watershed times that saw publication of influential books such as *Silent Spring* (Carson 1962), *The Population Bomb* (Ehrlich 1969), *The Limits to Growth* (Meadows, Meadows, Randers and Behrens Meadows et al. 1972), and *Diet for a Small Planet* (Lappé 1975); as well as the emergence of the philosophy of bioregionalism (Berg and Dasmann 1978).

In environmental education, David Orr's *Ecological Literacy* (Orr 1992) is considered by many to be a comparably seminal work. Synthesizing quantitative data with critical reviews of philosophers and scholars from Bacon to Thoreau to Lovelock, Orr forcefully argued that contemporary models of education, fixated on classical works and afflicted by overspecialization, have abetted anthropogenic damage to environmental systems. To Orr, a universal symptom of mainstream learning, found in teachers and students alike, is "displacement," manifested not only as ignorance of local natural and cultural history, but also as a diminished capacity to teach or learn through observation and physical interaction with surroundings. Orr described this estrangement of pedagogy from place as both unsustainable and irremediable from within the current system. His alternative is explicitly situated in place, infusing Dewey's experiential curriculum and Geddes's and Mumford's regional survey with environmental inquiry and an ethical commitment to preservation of life and habitat (Leopold 1966). Orr named two important outcomes of this

approach as *ecological literacy* – intimate understanding of natural processes and limits comparable to the abilities to read and calculate – and “reeducating people in the art of living well where they are” (Orr 1992, p. 130).

Gruenewald (2003) drew deeply from humanistic and scientific works on place to characterize its pedagogical value in terms of five dimensions: perceptual, sociological, ideological, political, and ecological. Presented as a theoretical framework for place-conscious or place-based education, this analysis also abundantly demonstrates that authentically place-based teaching is as transdisciplinary as the construct of place itself (Gruenewald 2003). Here, Gruenewald also introduces the idea of “accountability to places”: using measures of social, cultural, economic, climatic, and ecological health of the places where students live and learn as indicators of instructional success, instead of test scores. Similarly, Ault (2008) recontextualized “competitive equity,” application of uniform standards and tests with the intent of eliminating sociocultural disparities in student success, as “reciprocal equity,” in which building relationships and meeting responsibilities to place have the same desirable result.

## Standardization, Globalization, and Displacement

The current emphasis in US K-12 schools on curriculum standards and program evaluation by standardized testing, while outwardly intended to foster equity and make schools accountable, is nevertheless in keeping with the century-old, decontextualized efficiency paradigm (Gruenewald 2008). This, in turn, has been cited as a contributing factor, along with consumerism (Sack 1992), immersion in entertainment media and virtual reality (Pergams and Zaradic 2006), and economic globalization (Mander and Goldsmith 1996), to placelessness (Relph 1976) and estrangement from nature (Louv 2006) among citizens of developed nations. This syndrome is empirically linked to environmental degradation, or acquiescence thereto (Vorkinn and Riese 2001), and to extinction of languages and cultures around the globe.

Globalization and conflict around the world have displaced millions of people and climate change is predicted to displace hundreds of millions more (Dasgupta et al. 2007). Recent estimates are that about two billion people are currently displaced (Cerneia 1997). In 2009 alone, a record 45 million people were displaced, and more are conflict refugees. Over half of these are children. As many as 10% of the population in developed countries are immigrants, and in many places this percentage is much higher.

As people become resettled, often in distant nations and separated from their families and former communities, it is even more critical that they be enabled to build affirmative new senses of place through place-based education. Without a sense of connection to place, they are unmoored and may suffer from disorders of identity and personhood. They are not only homeless, but placeless. Cernea (2000,

p. 3664) notes: "For refugees, homelessness and; 'placelessness' are intrinsic by definition." Involuntary relocation is harmful to the displaced, who are extremely likely to suffer from posttraumatic stress disorder. Cernea (1997) cites other negative consequences of relocation.

An example of the effects that can result from displacement and relocation can be seen in a collectively traumatic event that befell the Navajo Nation late in the previous century. This is the largest indigenous nation living on the most extensive reservation in the USA, extending across the high-desert Colorado Plateau region of northern Arizona, northwestern New Mexico, and southeastern Utah. The Navajo reservation surrounds the smaller reservation of the Hopi Tribe, earlier occupants of the region who are culturally and linguistically distinct from the Navajo, but who have coexisted with them for centuries. The Navajo were also displaced in the nineteenth century and interned for some years before returning to their homes in this area. This episode is today known as "The Long Walk." In 1974, the Navajo-Hopi Land Settlement Act was established to partition jointly used lands in a buffer zone between the two reservations (Schwartz 1997). Few Hopis were displaced, but hundreds of Navajos were subjected to what has been referred to as the largest forced relocation in American history since the internment of Japanese-Americans during World War II (Schwartz 1997). "New Lands" were established for relocatees in an area with similar physiography, climate, and ecology adjacent to the existing reservation, but most Navajos did not readily acquiesce, because their culture attaches them to very specific places by burial of the umbilical cord near the homestead soon after birth.

This attachment to place is first established during the prenatal stage of life and reaffirmed at every step on the path to full Navajo personhood is solidified shortly after birth through burial of the umbilical cord. This act anchors an individual to a particular place. This sense of anchoring, and the spiritual and historic nature of the connection to one's home, is implicitly understood in the Navajo world. (Schwartz 1997, p. 43)

Schwartz (1997) quotes Katherine Smith, a Navajo from Big Mountain, a place of particularly strong resistance to relocation:

We are not like that [referring to the Euro-American propensity to move]. We just live on this, in these six sacred mountains all the time, all of our life. When you are in the pregnant, you are inside of your mother. You got your mother's breath, and it's the same with the Big Mountain, that way. It is my breath. See, I was born around the Big Mountain, and so that is my mother too. So all of my life, I just will always be thinking of this place. My spirit is going to be here forever. (Smith, quoted in Schwartz 1997, p. 47)

The threat of removal was traumatic to the majority of relocatees, who were concerned about loss of grazing lands for the livestock that form the basis of their livelihood, and loss of the ability to pass these lands and herds to their children (Scudder 1982). Observers noted effects such as impoverishment, depression, increased alcohol abuse, and higher rates of illness and mortality.

Swainson and McGregor (2008), in their discussion of Malaysia's removal of two indigenous Orang Asli communities for dam construction, point out that

although the government provided a compensation package that was designed to improve their post-relocation living conditions, the people themselves felt that monetary compensation could not replace their loss of place, their spiritual connection of a river now inundated, their role as guardians for this river, and their identity. Differences were found between the two villages related to their place-based values, attachments, and spirituality; and the success of their relocation. The authors conclude that compensation and socioeconomic assessment of consequences may often miss the mark. Ethnographic techniques such as participant observation, in-depth unstructured and structured interviewing, and use of cognitive techniques such as free listing, can tease out information on place meanings and place attachment prior to relocation, and inform predictive assessments of adjustment after relocation. Ideally, such data should be used proactively before final decisions are made, to avert the many negative consequences of relocation. With what was learned from this study and earlier work by Scudder (1982, 2009) and others, governmental and private organizations can go beyond current policy such as that of the World Bank for relocations and resettlements.

## Contested Places

Place is fundamental to both individual and sociocultural identity. It is also a set of persistent emotional ties that form part of the basis of identity; that is, place attachment, one component of the sense of place. For the most part, place attachment is molded through the oral tradition, both in literate and nonliterate traditions. However, it can also be created through social and historical memories; and explicit teaching in schools, cultural institutions such as museums, and visits to cultural and historical sites. These processes create place meanings, which also contribute to sense of place.

When different groups have different senses of place attached to the same places or areas, conflict may occur. In many cases, these concerns are relatively local, and are often ignored by development planners, whether large or small. Projects can and do displace and often impoverish millions of people throughout the world; dam-building is one of the most prevalent causes. Many of the people affected most strongly by such displacement are indigenous people. Although there is a robust literature on this problem (e.g., Scudder 1982, 2009), and in spite of scholarly consensus on causes and effects, devastating impacts continue worldwide. Places may be contested by competing rhetorics, public campaigns, advertising, political power, legal action or threat of this where appropriate laws exist, but can also escalate to sabotage, direct conflict, and even wars.

As globalization and development spread, contestation over places important to different groups for different reasons can be expected to occur. This will be an evermore important effect as the world population grows, and as different ideologies and religions expand their spheres of influence.

## Contemporary Example of a Contested Place: Superior, Arizona

The physical and cultural landscapes of the region around Superior, Arizona, 80 km east of Phoenix, epitomize a diversely meaningful place: a passage between low deserts and rugged mountains used for millennia, an area occupied by indigenous peoples both prehistorically and historically, a mining district that yielded millions of dollars in silver and copper while attracting an ethnically diverse population to work the mines, and a struggling rural community whose cultural identity is challenged by the encroachment of the nation's fifth-largest metropolitan area.

At Superior, the physical landscape directly influenced and continues to influence the evolution of the cultural landscape. The town is situated at the dramatic boundary between two major physiographic provinces of the southwestern USA. The Basin and Range province is characterized by parallel serrated mountain ranges and alternating broad, flat, arid basins extending far to the west and southwest. This is Sonoran Desert country typified by saguaros, legume trees, creosote bush, and venomous reptiles. In the other direction, the land rises abruptly to Apache Leap, a precipitous cliff of volcanic rock, through the ruggedly mountainous Transition Zone, then higher still to the Mogollon Rim and its ponderosa forests, which mark the edge of the high-desert steppes of the Colorado Plateau. Such variation along a relatively narrow belt reflects a complex geological evolution over 1.8 billion years (Jenney and Reynolds 1989), including episodes that veined and infused the subsurface with deposits of silver and copper, among the deepest and richest in the western USA (Hammer and Peterson 1968). Mining was the driver for land seizures by EuroAmericans from native peoples, and stimulated the American settlement of what became the Territory, and later State, of Arizona.

After the US war with Mexico, the 1848 Treaty of Guadalupe Hidalgo, and the 1864 Gadsden Purchase, all of the region around Superior, homeland to the Yavapai and Apache people, had become part of the USA. Military actions to seize land for mining and settlement ensued. Those indigenous people who survived were placed on reservations, but even these were further reduced by federal action whenever a new mineral deposit was discovered within their boundaries. Thus, the Yavapai and Apache soon came to retain very little of their original homeland. Dispossession of indigenous peoples from their aboriginal natural and cultural environments limits or eliminates their capacity to follow traditional lifeways, in turn causing losses to food security, well-being, and the deeply place-based sense of cultural identity. Nevertheless, many native people retain ties to places no longer readily accessible to them, particularly in the southwestern USA. Even when such lands have come under government control, visits to pray, collect resources, and maintain a sense of cultural affiliation still take place.

The US military was drawn to the Superior area for its geographic advantages, and a soldier stationed here in 1870 discovered a silver lode that triggered the establishment of a permanent mining community within a decade. The silver boom did not last, but great copper deposits were also at hand, and copper was suddenly in demand for electrification projects across the nation. Smaller local

operations consolidated into the Magma Mine, an important underground copper mine that operated profitably most years through booms and busts. The Magma Mine was the economic mainstay of Superior until it closed in the early 1990s, causing major economic losses and the departure of about half of the town's population.

However, an even richer copper deposit was discovered about 2,135 m (7,000 ft) beneath the surface east of Superior, a depth inaccessible to mining technologies until only recently. The global mining firms Rio Tinto and BHP Billiton formed a new company, Resolution Copper Mining (RCM), to explore the feasibility of extracting this deposit, which appears to be the richest undeveloped copper resource in North America. The proposed mine would have a life span of about 66 years, and its total economic impact on the state has been estimated to exceed US\$46 billion (Pollack and Company 2008). RCM reports that since 2001, it has invested about US\$290 million in exploration, feasibility studies, remediation of the former Magma Mine site, construction, and community education and outreach projects (Matthews 2009). Another US\$4 billion may be needed to complete the mine (Sullivan 2009).

For many Superior residents, the proposed Resolution mine is the best hope of saving the town, but Apache and Yavapai people, still strongly attached to places throughout the area, have contested the proposal. Each tribe has former lands in the area, sacred sites, sites for resource collection, and environmental concerns. One of the significant places potentially impacted by the proposed new mine is a popular campground in Oak Flat, the headwaters basin of Queen Creek east of Superior. This place, currently under jurisdiction of the US Forest Service, would almost certainly be physically impacted by mining, and is part of a Federal-owned parcel RCM seeks to obtain by exchange for other environmentally sensitive lands that the firm has purchased. Such an exchange must be approved by the US Congress. Land exchange bills have been introduced several times without passage, and at the time of this writing, a new one (Senate Bill 409 or S. 409) is in committee.

Oak Flat has been an important camping and gathering area for Apache people for centuries, and has some significance for the origins of certain Apache clans. The area is rich with Emory's oak trees, a source of acorns that constituted an important food source for the Apache and Yavapai, and remain important for cultural purposes today. Acorn stew, always served at ceremonies, is emblematic of Apache identity. Basso (1996) has noted that Apaches use place names as icons of human events that happened in these places. They use the stories of these localized events to teach moral lessons, thus anchoring their moral system in the landscape. For these reasons, Apache people view Oak Flat as sacred and as critical for the maintenance of their traditions and culture. Apache spiritual and political leaders oppose the proposed mining project:

Apache spiritual beings, our Gaan, exist within the three sacred sites of Oak Flat, Gaan Canyon and Apache Leap affected by S. 409. These sites become RCM property and subject to its proposed mine. Yet, to Apache, the Gaan live and breathe in those sites.

The Gaan are the very foundation of our religion; they are our creators, our saints, our saviors, our holy spirits. (Nosie 2009, p. 6)

The leaders have also expressed concern over possible environmental damage and have questioned how many mining jobs would actually be made available to tribal members. The Oak Flat area also includes cliffs and boulders long favored by climbers and other recreationists, who have expressed opposition to the land exchange and the mine. Local chapters of national environmental organizations and local grassroots environmental groups have expressed a range of positions regarding S. 409, from strong opposition (Bahr 2009), to support with certain qualifications (Campana 2009), to approval (Shearer 2009). This is a reflection of differing views on potential damage to the Oak Flat area, and the ecological and environmental value of the parcels that RCM has offered in exchange.

The Apache Leap escarpment, located between Oak Flat and the town of Superior at its base, is not within the footprint of the mine but is also a place of dispute, because of its spectacular beauty and its many archaeological sites, which are presumed to be Apache but might also be Yavapai. Both the Apache and the Yavapai were mobile hunter-gatherers or foragers and part-time horticulturists, who established camps and moved through a seasonal round collecting wild foods, hunting, and planting limited crops. They also had centuries of peaceful trade, intermarriage, and adjacent band territories; and both were interned together on the San Carlos Apache Reservation (about 60 km east of Superior) for a generation, until the Yavapai were allowed to leave after 1905. There is a wealth of historic material on the Apache, but much less on the Yavapai. Archaeologists and anthropologists have expressed opposition to the land exchange absent additional research and mitigation efforts at Apache Leap (Society for American Archaeology 2009).

Today, the population of the town of Superior is 69% Hispanic. Many of the residents' ancestors came here in the nineteenth century, from older mining communities in Mexico, to work the Magma Mine. Their descendants are now raising the fourth generation of Superior residents and for many the self-identity as *mineros* remains as strong as ever. The Magma Mine also employed eastern Europeans, whose descendants have married into the town. There are also two large Chinese extended families, whose grocery and supply businesses have long served the community. The population of Superior was long considered particularly well educated for that of a small, rural town, and many of its citizens have served the state of Arizona in public office.

Residents of Superior are strongly attached to the town and its desert and mountain surroundings. Our ongoing ethnographic, ethnogeological, and pedagogical studies in the area have revealed that residents score very highly on quantitative measures (Semken and Butler Freeman 2008) of place attachment to and place meanings of the town and its adjoining landscapes. Even those forced by economic necessity to move to larger towns in the Phoenix metropolitan area to the west continue to express strong ties to Superior. Many who live elsewhere but claim Superior as their home make frequent visits.

Yet since the closure of the Magma Mine in the 1990s, residents are experiencing some of the consequences commonly reported in displaced people:

land-lessness ... joblessness ... homelessness ... marginalisation ... food insecurity ... increased morbidity ... loss of access to common property resources; and ... community disarticulation. (Cernea 2000, p. 3662)

We were repeatedly told of marriage breakups, unemployment, lack of food security, depression, hopelessness, increased rates of substance abuse, increased crime, loss of land and homes, and impoverishment after the final closure of the Magma Mine. Superior not only lost most of its population and economic base with the loss of the mine; it also lost most of its cultural resources: shops, community organizations, and events. Older residents still mourn the loss of this multicultural vibrancy, but remain fiercely loyal to the town and hopeful for its future. Some community organizations, such as a chamber of commerce, art league, museum, and Ballet Folklorico, still remain; and Superior still celebrates many traditional events with parades, dinners, and dances. In the last 2 years, several new businesses have opened in its downtown, signifying optimism for the survival of the town.

The leaders of Superior have decided that they never again want to be dependent upon a single economic engine, and have begun to explore the possibilities of an artist community and ecotourism, both of which have taken root in and helped to sustain former mining towns in other parts of Arizona and the southwest USA. RCM has expressed its support for a more diverse and sustainable economy and has funded some educational and community-development initiatives, including a planned historic trail that would link Superior to a nearby state park and a well-used cross-state hiking trail. Still, a recent poll (Merrill 2007) indicated that most residents of Superior and neighboring towns strongly endorse development of the Resolution mine as the surest route to renewed prosperity.

Many Superior residents have expressed opinions that Apache and Yavapai opposition to the mine project is illegitimate, because the land in question is not part of their federally designated reservation. Forcibly removed to more distant parts of Arizona in the nineteenth century, the original inhabitants of the Superior area are now viewed as outsiders by many residents whose own families arrived much later, but who have resided here continuously ever since: "We don't tell them [the Apache] what to do. Why do they come here and try to tell us what to do?"

It is interesting to note that a majority of the local participants in this dispute come from underrepresented minority groups that have experienced displacement and relocation at some point in their histories. Nevertheless, a common misconception of many non-Natives is that because the Yavapai and Apache no longer occupy Oak Flat, and because their continued visits for ceremonial or family purposes are not readily apparent to townspeople, that the Native Americans had no concern for the place until RCM showed interest in it; whereupon they saw an economic or political advantage in opposing the mine project.

Misconceptions also exist on the other side of the dispute; for example, reasonable questions about the impact that an underground block-caving copper mine would have on the present land surface become amplified into geologically unsupported assertions that all of Apache Leap could tumble into a yawning pit.

### **Discussion: Implications of Sense of Place and Place-Based Education for Superior and Other Contested Places**

The area encompassing Superior, Apache Leap, Oak Flat, and the surrounding high country and low desert has been a richly endowed, naturally and culturally meaningful place through several millennia of human habitation. It is presently a center of conflict over deeply held place-based values and beliefs, variously held by people who perceive themselves as having equally strong attachments to the place. Hence, the dispute over this and similarly contested places can be seen as a conflict among different and seemingly irreconcilable senses of place. In a time when such contests are increasingly likely to be settled by legal decisions rather than by superior force, place-based education can help each of the different and opposing groups to understand the stakes that each has in the dispute. Few non-Natives understand the bonds to ancestral homelands that traditional Apaches and Yavapais maintain, and few can comprehend why they may hold its spiritual value above its economic value. Few visiting naturalists and rock climbers may accept that a fourth-generation miner in Superior could love the local environment just as much, if not more, than they do. Someone with no geologic or economic background might wonder why RCM would want to mine copper beneath Oak Flat, rather than some other place out in the open desert. Young Superiorites or San Carlos Apaches might wonder what will happen to their families and communities when the mine ceases operations 6 or 7 decades hence.

These kinds of meanings and attachments, if preserved and passed on in their entirety, will help all of the stakeholders in the Superior area, present and future, to politically and legally advocate for its continued ecological integrity and cultural sustainability. This could mean action pivotal to a Congressional decision on the land exchange, but it could also mean long-term, objective, community-based monitoring of the environmental and social impacts of the mine, if it is built on schedule, or an alternative economic development plan, if it is not.

What is most critical is that these dynamically changing places are always cared for in a sustainable way; that schoolchildren who may someday work in such a mine receive an authentically place-based education that enables them to explore the local biosphere, reveals the geological processes that created the copper deposits, portrays the full human history and lifeways of the area, and imparts a balanced understanding of all stances on the issue. Such things are not typically taught in local schools or regional colleges, nor explained in depth by local museums and media outlets, nor distributed on flyers or through digital social networks ... but

they could be. Place-based teaching and learning can endow succeeding generations not only with the knowledge needed to look after local places, but with love and attachment that will motivate them to do so.

At the same time, locally situated studies and action research needed to inform and periodically refresh an authentically place-based curriculum may reveal constraints on sustainability known only to populations with long histories of residence. Place-based education is a mutually beneficial transaction among people and place if it enhances the senses of place and local knowledge of students and teachers, while also fostering care for places that promotes their ecological integrity and cultural sustainability.

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