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Sediment Removal from the San Gabriel Mountains

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SEDIMENT REMOVAL FROM THE SAN GABRIEL MOUNTAINS

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In partial fulfillment of a Bachelor of Arts Degree in Environmental Analysis,
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Readers:

Professor Bowman Cutter, Pomona College

Professor Char Miller, Pomona College

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Introduction

On January 12, 2011, eleven acres of the Arcadia Woodlands were removed by the Los Angeles County Department of Public Works to provide a place to dump sediment that had over-accumulated behind dams in and around debris basins. The woodland habitat housed numerous native plants and trees including coast live oaks, sycamores and various scrub and brush. Very few people were aware of the decision the County had made. Four brave individuals, known as “the Arcadia Four,” learned of the impending action and opted to sit in the treetops to protest the removal of old-growth oaks; they were later arrested. According to the *Los Angeles Times*, the “Arcadia Four” faced jail time and hefty fines up to \$20,000. In August 2011 they plead no contest and were sentenced to community service. Their pleas will be dismissed after one year. John Quigley, one of the tree sitters, stated why he camped out in the oak grove, “out of necessity to defend the public good and our natural heritage,¹” By the day of the woodland removal, a growing number of people were aware of the situation. Various media outlets and actress Darryl Hannah tried to gain access to the site, but were denied entry by the Arcadia Police Department. Hannah compared the destruction of the Arcadia Woodlands to “a real life avatar,²” in reference to the high grossing James Cameron film that depicts a fictional species on another planet who's natural and sacred areas are threatened by American (Earth) military forces for access to their natural resources.

1 Sahagun, Louis. “Century-Old Oaks May Make Way—For Silt.” *The Los Angeles Times* 4 December, 2010. Accessed 18 November, 2011
<<http://articles.latimes.com/2010/jan/18/local/la-me-station-fire-fish18-2010jan18>>

2 John Stephens and Matt Burch, [Daryl Hannah Calls Arcadia Woodlands Destruction 'Real Life Avatar'](#) (SierraMadre.patch.com, 2011)

Despite the public outcry, over 250 trees were destroyed in the span of two days. Soon after the decimation, word spread and momentum grew to protest the removal of oaks and sycamores from the Arcadia Woodlands and a few actions were taken to address the decision made by the County to level a woodland habitat. A community-based organization was born out of concern of the County's land-use decisions called the UrbanWild Network, made up of members from the Arroyo Seco Foundation and writers from L.A. Creek Freak blog. The DPW also responded to concerned citizens by forming a Sediment Management Task Force to include them, as well as regulatory agencies, cities, landfill owners and operators, water agencies, sand and gravel companies and environmental groups, in the process of coming up with a plan to manage the over-accumulation of sediment. The Council for Watershed Health also held a Sediment Management Symposium on September 20, 2011 in which the County, environmental groups and other agencies had a chance to discuss the problem with the over-accumulation of sediment in the San Gabriel Mountains.

Other areas have been targeted for short-term sediment removal including - Hahamongna Watershed Park in Pasadena and La Tuna Canyon near Burbank, along with the remaining 10 acres of the Arcadia Woodlands. For now plans have been postponed to move forward with habitat removal in La Tuna Canyon, although a chain link fence still surrounds hundreds of oaks with metal death tags marking them for future demise. An intense and publicized debate rages on with Hahamongna Watershed Park. The Station Fire along with years of storms and poor management practices by the County, has created a build-up of sediment that threatens the integrity of the Devil's Gate Dam and the neighborhoods below it. If all goes according to plan with the County, 15 acres of black willow trees will be removed to dump 1.6 million cubic yards

of sediment, compared to the 500,000 cubic yards of sediment that was placed in the Arcadia Woodlands from the Santa Anita Dam.

The Station Fire

The most exacerbating factor in sediment over-accumulation in recent years was the Station Fire, which burned 160,577 acres over a period of nearly two months from August 26 – October 16 2009.



Figure 1. View of flames coming over ridge near Zorthian Ranch, Altadena, CA

The fire claimed 209 structures and the lives of two fire fighters, becoming the largest fire documented in Los Angeles County history and the 10th largest documented fire in California history. The Station Fire caused the evacuation over several neighborhoods in various cities, including Altadena where I live. Zorthian Ranch (fig. 1) was forced to evacuate several animals including goats, horses and llamas as the fire moved in close behind the ridge. My neighborhood was on the evacuation list. After packing up a few random valuables and rounding up the cats, the fire's direction shifted and allowed for us to stay put. The fire was so large, and burned such an enormous amount of fuel, that it caused a rare pyrocumulous cloud to form above the San Gabriels. I could see the fire from my front doorstep and could barely breathe from the smoke that clogged the air. Soon the fire moved over the range and was eventually contained. Many trails and campgrounds were closed at least a year after the fire due to an unstable terrain and a heightened threat of landslides.

The Station Fire is a reminder that the Los Angeles region is a fire ecology which means that it actually requires fire to regenerate and evolve. The Native population understood this, whereas the European settlers knew little about the ecology of the New World, and equated all fire as a negative force rather than a biological necessity. This myopic view of landscape ecology runs parallel to the limited understanding and scope in the management of the watersheds and rivers. Southern California has a unique topography, made even more exceptional with the constructs implemented by a long line of politicians and engineers fighting against nature, through flood-control management efforts, such as channelized rivers and a network of debris basins. These efforts helped Los Angeles to develop into a dense urban sprawl, and transformed it into the most populated and dense city in the United States behind New York City.

Southern California has quite a few distinguishing factors which make it an anomalous area. As Dr. Cheryl Swift pointed out during the Sediment Management Symposium on September 20, 2011, there are five months of drought in Southern California compared to other Mediterranean climates such as the Cape of Africa which only has two months of drought. The Los Angeles region also has a high coefficient of rainfall which, when combined with several months drought, frequent fires, and a young, constantly evolving mountain range, makes for an unstable and unpredictable landscape. The San Gabriel Mountains are still growing, in fact they are one of the fastest growing worldwide, and they are also disintegrating at roughly the same rate, leading to a substantially high amount of erosion and instability; as John McPhee writes, “A METROPOLIS that exists in a semi-desert, imports water three hundred miles, has inveterate flash floods, is at the grinding edges of two tectonic plates, and has a micro-climate tenacious of noxious oxides will have its priorities among the aspects of its environment that it attempts to control.”³

The sediment would normally flow down the mountain and deposited along the way in riparian streams and rivers and eventually make its way to the ocean to replenish and nourish beaches. The intense development in Los Angeles, along with the implementation of the flood control system has hindered that process. This is problematic for downstream communities as sediment builds up and if untrapped, can cause devastating debris flows which can result in property damage and death. Prior to the channelization of the rivers in the L.A. Basin, the water braided across the landscape switching constantly back and forth as the seasons and weather changed. Intense rainfall in a short period of time frequently changed the course of the river. As Los Angeles was growing, a few disastrous floods such as the Los Angeles Rivers Floods of

3 McPhee, John. *The Control of Nature*. New York: Farrar, Straus, Giroux, 1989. Print.

1914, 1934 and 1938, which spurred the Army Corp of Engineers to channelize the rivers by encasing them in concrete to prevent flooding, as well as building a series of dams and debris basins.⁴

Over time, various floods and fires allowed sediment to build up, particularly after the Station Fire in 2009. Over 1.2 million cubic yards of debris was deposited in the debris basins during the 2009 – 2010 storm season after the fire. The County spent \$40 million during the 2009 – 2010 storm season to control the debris and has budgeted \$202 million over 5 years for sediment removal projects.⁵

The County felt a sense of urgency to remove the sediment from the debris basins to avoid a catastrophic event such as an uncontrolled debris flow, or “liquid landslide” like the one John McPhee recounts in his book *The Control of Nature* in which a debris flow occurred in Shields Canyon and filled up a house with rock and debris within 6 minutes, “The dark material coming towards the Genofiles was not only full of boulders; it was so full of automobiles it was like bread dough mixed with raisins.”⁶ Some debris flows are so large and destructive that they scar the landscape, cutting grooves into the soil.

The safety of foothill residents is the main reason why the County is so concerned about the overflowing debris basins, but many people are unhappy with their short-term solutions to remove large swaths of native habitat, particularly since they feel that the County has grown rather complacent with sediment removal, which in the case of dams, has turned into a management by emergency basis. Opponents of the County's short-term sediment management

4 Orsi, Jared. *Hazardous Metropolis*. Berkeley: University of California Press, 2003

5 Hildebrand, Gary. "Shifting Soil: Sediment Management Policies in Los Angeles." Sediment Management Symposium. Descanso Gardens. La Canada, 20 September 2011. Sediment Management in Greater Los Angeles.

6 McPhee, John. *The Control of Nature*. New York: Farrar, Straus, Giroux, 1989. Print.

practices are outraged by their seemingly rash and shortsighted decision to turn numerous acres of habitat thousands of years old to a dumping site. Even though the vegetation in areas such as the Arcadia habitat quickly regenerate, such as the hardy sycamore and willows, the wildlife is having a hard time adapting to the loss of their food, shelter and breeding grounds and cannot be expected to recover quickly, if at all.⁷

This loss of biodiversity is part of a larger problem worldwide in which dominant human interactions with nature are creating long term and destructive shifts in the landscape. These destructive interactions create issues such as desertification, loss of healthy, nutrient-rich soil, and climate change. Monrovia Planning Commissioner, Glen Owens offered his thoughts on the Arcadia Woodlands habitat removal, "I've got the same feeling I get when I see cattle on their way to slaughter," he said. "Don't get me wrong - I'm not a doggone tree-hugger. It's just that sometimes making the world a better place means saving the better things in it."⁸ Habitat removal goes far beyond a fuzzy tree-hugging hippie mentality, if we separate ourselves from natural processes, humans could also end up with the same fate as the Arcadia Woodlands: extinct.

When looking at the problem of habitat removal, one could argue that the Los Angeles basin should not have been developed at the rate and density of its current state. Aside from evacuating a large portion of Angelenos to make way for the floods, fires, earthquakes and droughts that will continually affect the region, we must find a way to deal with the situation as it now stands which means dealing with the flood control system and its shortcomings. Learning

7 Swift, Cheryl. "Shifting Soil: Sediment Management Policies in Los Angeles." Sediment Management Symposium. Descanso Gardens. La Canada, 20 September 2011. Response Panel.

8 Sahagun, Louis. "Century-Old Oaks May Make Way—For Silt." [The Los Angeles Times](#) 4 December, 2010. Accessed 18 November, 2011

from the destruction of the Arcadia Woodlands could provide a new and more progressive template for engineers and environmentalists to form a more holistic path forward that looks critically at land use decisions and shifts future plans to follow natural processes closely and complimentary.

The days of dominating nature with concrete and re-bar must be left in the past, along with agencies with a narrow scope in one specialization, and instead look at interconnected systems and long term impacts when designing flood control systems; looking at rivers and streams as such, instead of flood control structures; and sediment as a vital part of the system, rather than a waste product. The mentality and the nomenclature must change to ensure a long-term future for the millions of Angelenos who must endure the outcome of any sort of decision making.

The County has recognized the need to return to more natural processes as outlined in their long-term sediment management plan which also includes alternative forms of engineering such as conveyor systems, sluicing, slurry pipelines, rail transport and cable bucket systems for sediment removal and deposition. The most contentious issue lies with short-term plans for sediment removal, which still involve destroying several acres of native habitat. A few questions come to mind: How did we get to this point of destroying habitat to dump sediment which is viewed as waste product? What are the barriers for creating long term solutions and progressive change? What are some other options? And how should we move forward?

History of development in Los Angeles

To understand how to manage the landscape, it is important to understand the history of land-use and development in Los Angeles. The Los Angeles area was home to the Tongva, a native Californian tribe that inhabited what is now the Los Angeles and Orange County regions. Contrary to the general perception that pre-colonial California was a wild and untended wilderness, the Tongva carefully managed the land by working alongside natural processes. “Instead of relying on the axe, rake, or plow, they skillfully learned to prune, till, coppice, transplant, and burn California's vegetation in order to encourage a greater abundance of plant and animal foods and materials. The land yielded its bounty to the ingenuity of native intervention and was substantially transformed in the process.” The tending of the landscape for thousands of years by native Californian's created a reliance of flora and fauna on human interaction to create a stable ecology. They have been referred to to as a “keystone” species that kept the anomalous and delicate Southern California ecosystem balanced.⁹

The careful balance cultivated by the Tongva was disturbed by a large influx of Europeans who came soon after colonizer Gaspar de Portola arrived in Southern California in 1769. Their settlement upset the stable ecosystem by introducing Old World pathogens, along with invasive flora and fauna, which would render native vegetation, wildlife and people that were in place since the end of the last Ice Age, nearly extinct.

As European migrants settled in the West, further missteps were made as a result of their naivete to the landscape. Between 1915 - 1924 the Forest Service attempted to convert chaparral watersheds into forests via a reforestration program. During this time “approximately 500,000

⁹ Preston, William, Chapter 10: Serpent in the Garden. In, *Contested Eden: California Before the Gold Rush*, edited by R. Gutierrez and R.J. Orsi, pp. 260-298. California Historical Society, San Francisco, and University of California Press, Berkeley.

trees were planted and many tons of seed sown on the watersheds of Los Angeles County.” The tree species included the native coulter pine, and non-native eucalyptus, which turned out to be vulnerable to falling over and absorbed a large amount of water – not a desirable trait in a semi-arid climate. By 1930, the Forest Service realized “the value of chaparral as a precious watershed cover that perhaps is fire dependent and best adapted to the site.”¹⁰

Around this time, Southern California was rapidly expanding to accommodate migrants looking for a better life and health. Many of the decisions made on development were greatly influenced by the Progressive Era, a period which favored specialization in government agencies and fostered technocratic structures where agencies had a narrow scope of expertise. An issue that came about with this structure was the inability and/or unwillingness of agencies to communicate and view projects, and their effects, on a holistic level. The Los Angeles flood control system is a perfect example of this type of situation.¹¹

Implementation of Flood Control System

The flood control system in Los Angeles was created after a series of floods caused concern to Los Angeles residents, most notably after two large scale floods in 1934 and again in 1938. Soon after this delegates demanded a “centralized authority” and a “comprehensive plan.” The Flood Control Act was created to quell the frayed nerves of residents demanding a all-inclusive plan to control flooding in the area.

¹⁰ Radtke, Klaus, “Wild Urban Plantings & Urban Forestry Native & Exotic 1911-1977. Los Angeles: County of Los Angeles, Department of Forester and Fire Warden, Jan 1978.

¹¹ Orsi, Jared. *Hazardous Metropolis*. Berkeley: University of California Press, 2003. p.111

Soon after, with federal funds from the New Deal, the Army Corp of Engineers set out to “reinforcing channels, building dams, and digging debris basins above the La Canada Valley.”¹² The operation and maintenance of the flood control system was handed over to the Los Angeles County Flood Control District soon after the project was finished, but the Army Corp of Engineers was, and still remains the main authority for any changes to the flood control system.

The Los Angeles County Flood Control District (LACFCD) is a division of the Los Angeles County Department of Public Works (LACDPW). The LACFCD was created to, “Control and conserve flood, storm, and other waste waters...” with two main purposes: “Flood Control” and “Water Conservation.”¹³ Any work done in the flood control system must first be granted permission by other agencies including the “Army Corps, the Environmental Protection Agency, the Department of Fish and Wildlife and the National Marine Fisheries Institute on the federal level; and at the state level the California Department of Fish and Game, the Regional Water Quality Board, the Coastal Commission and the Office of Historic Preservation.”¹⁴

12 Orsi, Jared p.107

13 Hildebrand, Gary. "Shifting Soil: Sediment Management Policies in Los Angeles." Sediment Management Symposium. Descanso Gardens. La Canada, 20 September 2011. Sediment Management in Greater Los Angeles

14 Bernstein, Sharon. “Thicket of Rules Fuels Flood Fears; SPECIAL REPORT. Foes Fight Killing of Channel Foliage, but for Officials trying to ease water flow.” Los Angeles Times. 12 October, 1997. Accessed November 20, 2011: <<http://ezproxy.libraries.claremont.edu/login?url=http://search.proquest.com.ezproxy.libraries.claremont.edu/docview/421168907?accountid=10141>>



Figure 2. Upper San Gabriel River Watershed 1939



Figure 3. Upper San Gabriel River Watershed– Today

So far, the system has been successful in being able to move stormwater swiftly to the ocean via a series of over 500 miles of open concrete channels, 2800 miles of storm drains and 65 pump stations. Also part of the flood control system are 14 dams, 162 debris basins, 26 sediment placement sites (SPS) and three seawater barriers. As for water conservation, there are a few components in place that will capture and store stormwater including 16 rubber dams and 27 “spreading grounds”¹⁵ which allow for stormwater to spread out and percolate back into the soil to recharge the groundwater. Figure 3 shows the flood control system as it is today in what some people refer to as the “concrete straightjacket” which has been able to control the watershed and limit the possibility of widespread flooding in the Los Angeles basin.

¹⁵ Hildebrand, Gary. "Shifting Soil: Sediment Management Policies in Los Angeles." Sediment Management Symposium. Descanso Gardens. La Canada, 20 September 2011. Sediment Management in Greater Los Angeles

Chapter 1: Sediment Control Issues

Beach Replenishment

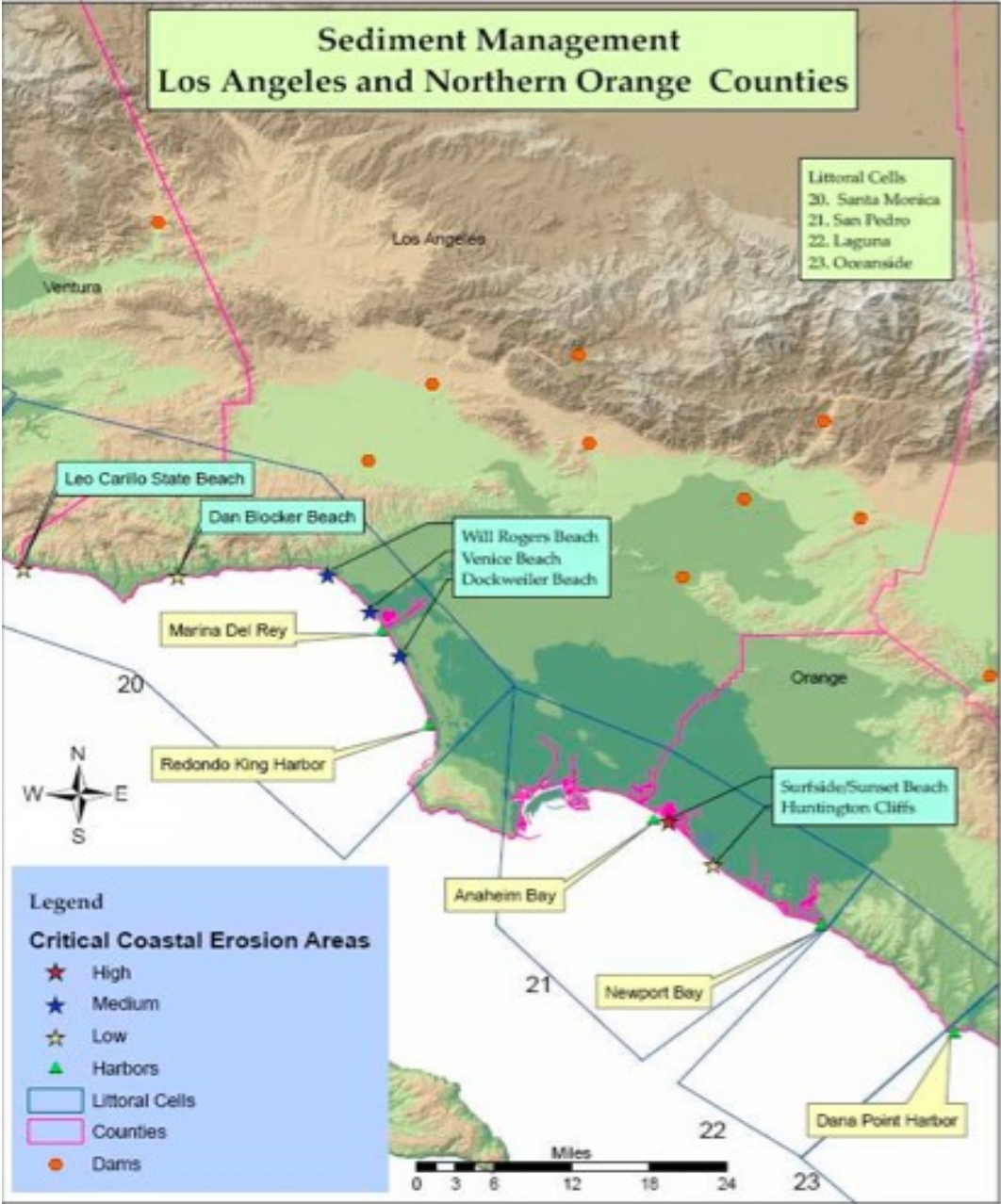


Figure 4. GIS map of Critical Coastal Erosion Areas. Source: Tim Brick Presentation at Sediment management Symposium 9/20/11

The issues with sediment control started with the implementation of the flood control system by the Army Corp of Engineers in the late 1930's. Sediment is a natural material that is part of the San Gabriel Mountains made up of silt, rock and boulders and makes its way down the mountain to the ocean. The sediment is normally deposited in the watershed and makes its way through streams and rivers all the way down to the ocean where it is deposited as sand to replenish and nourish beaches. The issue with the implementation of the flood control system, is that the sediment does not follow natural processes to make its way to the ocean, instead it is trapped in debris basins or behind dams until it is removed by the Los Angeles County Flood Control District or Army Corp of Engineers. Once the sediment is emptied from debris basins and dams, it is either sold to construction companies or, which is more frequently done, it is deposited into Sediment Placement Sites or used for landfill covers. The problem is that the sediment does not make its way to the ocean and has caused issues with beach replenishment leaving many beach areas in Southern California heavily eroded (figure 4). In 1987 the Los Angeles County Flood control district explored the idea of transporting sediment trapped behind dams and debris basins to beach cities along the entire coast. This was in response to the heavily eroded beaches in Malibu, where the beaches were disappearing at a fast pace from lack of sediment deposition that would normally flow down from the mountains. The issue that Flood Control District officials faced was approval from the Coastal Commission to deposit the sediment on the beaches for restoration purposes. The reason being that although restoration is allowed by the Coastal Commission, restoration efforts are not clearly defined.¹⁶ Many

¹⁶ Simon, Richard. "Using Trapped Sediment: Restoration of Beaches Sought." Los Angeles Times. 1 January, 1987 Accessed 18 November 2011
<http://ezproxy.libraries.claremont.edu/loginurl=http://search.proquest.com.ezproxy.libraries.claremont.edu/docview/153702324?accountid=10141>

Southern California beaches face problems with beach replenishment since sediment is blocked from reaching the coast. The problem has been made worse in recent years after large storm events where a large amount of sand has been washed away; creating further erosion and destruction. In Laguna Beach rocks and the remnants of an old sewer system became visible as sand was washed away. At Dockweiler Beach near LAX, “cobblestones were visible where there once was soft sand.”¹⁷

Habitat Destruction

The other issue with sediment control is the loss of habitat when sediment needs to be removed from dams and debris basins and deposited in another area. The Flood Control District has set aside areas called “Sediment Placement Sites” that are marked for future sediment deposition. More recently, there are three sediment placement sites that have come under scrutiny by the public and NGO's since they include a large number of oaks and riparian habitat: the Arcadia Woodlands in Arcadia, La Tuna Canyon in Burbank, and Hahamongna Watershed Park in Pasadena.

Arcadia Woodlands

The Arcadia Woodlands had 179 and 70 sycamores removed from 11 acres of woodland habitat, there are still 10 acres that remain with an uncertain fate. An Environmental Impact Report (EIR) was filled out by the County to assess the impact of habitat removal. In the EIR

17 Barboza, Tony. “Sand Vanishes From Beaches; The erosion is the worst in a decade as storms leave a rugged landscape of rock.” Los Angeles Times 2 April, 2010 Accessed December 1, 2011
<<http://ezproxy.libraries.claremont.edu/loginurl=http://search.proquest.com.ezproxy.libraries.claremont.edu/docview/422318377?accountid=10141>>

there were other options layed out that would spare the Arcadia Woodlands. In the end, 11 acres were removed. [Details of the EIR are in chapter 2.]

La Tuna Canyon



Figure 5. View of oak canopy in La Tuna Canyon. Photo by Camron Stone

The sediment placement site in La Tuna Canyon was chosen in 1985 by the County as they felt the previous practice of having contractors take the sediment for fill was too “leisurely” when having to deal with large amounts of debris washed down after a fire or storm event. Residents in the area were upset over the proposed loss of aesthetic space, as well as congestion and noise from trucks transporting the sediment. County officials projected limited use of La Tuna Canyon as a sediment placement site and estimated that in terms of use, “not at all in 35%

of the years, and for no more than two weeks in 15%.”¹⁸

After the Station Fire in 2009, La Tuna Canyon was considered an option for placement sediment. It was then fenced off and metal tags were hammered into more than 60 mature oaks (figure 6 and 7).¹⁹



Figure 6 & 7. Oaks tagged for removal. Photos by Camron Stone

However, the County decided to hold off on plans for deposition shortly after they were scrutinized for removing 11 acres of habitat in the Arcadia Woodlands in January 2011. In a statement from the Los Angeles County Public Works Department Public Affairs Manager, Kerjon Lee, stated that, “While we are no longer separately pursuing the development of the La Tuna Canyon Sediment Placement Site, it will be among the wide range of alternatives evaluated by the Task Force. In about 15 months, when, and if, the Task Force identifies the La Tuna site as a possible solution, the District will re-initiate the environmental process and come back to

18 Levin, Myron. “Sun Valley Residents Fear Truck Traffic Plan for Sediment Dump Draws Fire.” Los Angeles Times. 2 August, 1985. Accessed: 15 November 2011 <<http://ezproxy.libraries.claremont.edu/login?url=http://search.proquest.com.ezproxy.libraries.claremont.edu/docview/292138300?accountid=10141>>

19 <http://www.urbanwild.org/>

the community to solicit feedback.”²⁰ The “Task Force” refers to the Sediment Management Task Force created by the Los Angeles County Department of Public Works to work with NGO's, construction companies and members of the community to come up with a long term plan when dealing with future sediment placement.

Hahamongna Watershed Park

Hahamongna Watershed Park is located between the Jet Propulsion Laboratory to the north and Devil's Gate Dam near the convergence of Altadena, La Canada and Pasadena. The basin area where “the watershed meets the urban plain” As of October 2011, 13,000 cubic yards of sediment has been removed north of Devil's Gate dam and deposited in to the former Johnson Field site.²¹ In the meantime, the Environmental Impact Report is being filled out for the long term part of the project which would include digging up 1.5 cubic yards of mud and debris and remove 15 acres of black willow trees.

The Value of an Ecosystem

To better understand the importance of woodland habitats and specifically oaks, Rosi Dagit and the Topanga-Las Virgenes Resource Conservation District came up with two methods of estimating their value in economic terms, “The first assesses yearly savings for enhancements to your living environment. Consider:

Oxygen production	\$625
Air Pollution control	\$1,240

²⁰ Lee, Kerjon. Letter from Los Angeles County Public Works Department : “LACFCD no longer separately pursuing the development of the La Tuna Canyon Sediment Placement Site” 2011. Accessed November 30, 2011 http://www.urbanwild.org/la_tuna.html

²¹ <http://www.savehahamongna.org/hahaupdate110901.htm>

Soil erosion control and increased soil fertility	\$625
Enhanced groundwater recharge and storm runoff control	\$750
Food and shelter for wildlife	\$1,875
Reductions in heating/cooling costs by half when correctly placed	\$5,790

The other alternative is to calculate the actual replacement value of an individual tree.

Assessed Value = (basic value)(100)(condition rating)

Basic value = \$4,700 + \$2,700 (d-7) (d=diameter in inches of trunk at 4.5 feet above ground)

Condition rating = based on visual evaluation of the tree

90-100%.....Excellent

70-89%.....Good

50-69%.....Fair

25-49%.....Poor

0-24%.....Very Poor

Example: Coast Live oak in good condition with 25 inch diameter (4,700 + \$2,700 (25-7) (.100)

(.80) = \$42,640²² Using those calculations and assuming the measurements are somewhat comparable to the 179 oaks that were removed, the total value would be roughly \$7.6 million and that is without factoring a dollar amount for the 70 sycamores and the overall value of a regenerative and functioning ecosystem.

While the loss of oaks have been one of the greatest source of contention among members of the public and NGO's, the loss of a thriving ecosystem has been the more important factor, rather than focusing on one species. Dr. Cheryl Swift stressed this point during the

22 Dagit, Rosi. "Evaluating Your Oak's Net Worth" www.californiaoaks.org/ExtAssets/EvaluatingDagit.pdf

Sediment Management Symposium ²³ and it was reiterated by Lynette Kampe, Executive Director of the Theodore Payne Foundation, “Simply replanting dominant species does not make an ecosystem.”²⁴

23 Swift, Cheryl. "Shifting Soil: Sediment Management Policies in Los Angeles." Sediment Management Symposium. Descanso Gardens. La Canada, 20 September 2011. Response Panel.

24 Kampe, Lynette. "Shifting Soil: Sediment Management Policies in Los Angeles." Sediment Management Symposium. Descanso Gardens. La Canada, 20 September 2011. Response Panel.

Chapter 2: Managing Sediment

Interaction Between Agencies

The LACFCD has faced many issues with the Flood Control system, including a limited engineering scope by the Army Corp of Engineers and a laborious bureaucratic process which has delayed progressive changes to the system. As one L.A. Times reporter wrote in 1997, “in the past decade no fewer than eight federal and state agencies have asserted jurisdiction over flood control channels, creating a bureaucratic tangle so vast that obtaining permission to clear them out can take years.”²⁵

There were also issues between Coastal Commission and the Flood Control District when determining sediment placement at beaches. Both agencies recognized the need for sediment placement on badly eroded beaches, but because of regulatory compliances, there was a delay in placing the sediment simply because restoration practices weren't laid out clearly in the Coastal Commission laws.²⁶

There has also been adversary among regulatory officials. When dealing with sediment removal projects in 1997, one article had this to say: “For their part, regulatory agencies recognize that the process is slow and cumbersome, and have promised to authorize at least some work in the channels by the end of the month, so counties can prepare for El Nino.”²⁷

However the chief of the regulatory branch for the Army Corps' Los Angeles district, Richard

25 Bernstein, Sharon. “Thicket of Rules Fuels Flood Fears; SPECIAL REPORT. Foes Fight Killing of Channel Foliage, but for Officials trying to ease water flow.” Los Angeles Times. 12 October, 1997. Accessed November 20, 2011: <<http://ezproxy.libraries.claremont.edu/login?url=http://search.proquest.com.ezproxy.libraries.claremont.edu/docview/421168907?accountid=10141>>

26 Simon, Richard. “Using Trapped Sediment: Restoration of Beaches Sought.” Los Angeles Times. 1 January, 1987 Accessed 18 November 2011
<http://ezproxy.libraries.claremont.edu/loginurl=http://search.proquest.com.ezproxy.libraries.claremont.edu/docview/153702324?accountid=10141>

27 Bernstein, Sharon

Shubel felt different by defending the current system, “saying it is important to coordinate the sometimes conflicting needs of the eight regulatory agencies.” Shubel felt that temporary permits could have been granted the year prior “had officials not “dragged their feet in providing biological data and other information requested by the California Regional Water Quality Control Board.”²⁸ He went on to say that because of this some of the blame lies with the public works professionals. He reasoned why this was the case, "Part of the problem with flood control agencies is that they think flood control is the only value to these channels...It's not worthless stuff that they want to pull out of there."²⁹

Interaction Between Agencies and the Public

There has been a history of adversarial interaction between government agencies and the public when dealing with sediment. The Army Corps of Engineers came under scrutiny in 1984 from residents in the Lake View Terrace area in regards to sediment removal from Hansen Dam. Residents called the removal plans “inadequate and may not remove sediment faster than Mother Nature can deposit it.” Residents feared that if the rate of sediment removal wasn't fast enough, their homes may be in danger of flooding. They were also concerned that, “the dam's depleted lake may never regain its status as a major recreational area.” About fifteen years earlier, the 130-acre lake allowed for fishing, swimming and boating, without regular sediment removal, the lake became a “a murky, 30-acre pond” where swimming and boating were not longer allowed and few fish were left.³⁰

28 Bernstein, Sharon. “Thicket of Rules Fuels Flood Fears; SPECIAL REPORT. Foes Fight Killing of Channel Foliage, but for Officials trying to ease water flow.” Los Angeles Times. 12 October, 1997. Accessed November 20, 2011: <<http://ezproxy.libraries.claremont.edu/login?url=http://search.proquest.com.ezproxy.libraries.claremont.edu/docview/421168907?accountid=10141>>

29 Bernstein, Sharon

30 Sample, Herbert A. “Called Inadequate: Dam Dredging Plan Protested by Homeowners.” Los Angeles Times. 8 January, 1984. Accessed: 15 November 2011 <<http://ezproxy.libraries.claremont.edu/login?>

Hansen Dam was built in 1940 and was “designed to collect a maximum of 12.4-million cubic yards (mcy) of sediment in a 50-year time span without harming its ability to control the worst rainstorm that could be expected in the area during that half-century.” In reality, the capacity peaked in 1969, a little over half the expected time frame after heavy rains washed silt down from the hills. Soon after a large fire and subsequent storms deposited more sediment behind the dam.³¹

The Corps set up a meeting with residents and advised them that they will remove 700,000 cubic yards of sediment each year. Residents were not satisfied with that amount and felt the number should be closer to 2-million cubic yards. The Corps maintained that their systems would be effective in controlling flood waters, but it could take up to 20 years for it to be truly effective.

Residents near the Arcadia Woodlands also faced many issues in dealing with government agencies in regards to sediment removal. Local resident and member of UrbanWild Network, Camron Stone talked about his frustration with the removal of the Arcadia Woodlands and the County's plan to revegetate it after it was leveled, "It's in the plan - in the EIR that it will be closed and revegetated," he said, "(but) we discovered that it is not funded by the project... The DPW never went and got funding for that part of the plan."

After realizing the lack of long term plans for revegetating the Arcadia Woodlands, Supervisor Antonovich stepped in to address the issue, “In a conciliatory gesture, L.A. County Supervisor Michael Antonovich recently proposed a motion that if passed would provide

url=<http://search.proquest.com.ezproxy.libraries.claremont.edu/docview/153702324?accountid=10141>>

31 Sample, Herbert A. “Called Inadequate: Dam Dredging Plan Protested by Homeowners.” Los Angeles Times. 8 January, 1984. Accessed: 15 November 2011 <<http://ezproxy.libraries.claremont.edu/login?url=http://search.proquest.com.ezproxy.libraries.claremont.edu/docview/153702324?accountid=10141>>

\$650,000 in Los Angeles County Flood Control District funds for mitigation oversight and revegetation.”³²

One of the “Arcadia Four” treesitters, John Quigley noted his wariness of County's handling of the Arcadia Woodlands during and prior to the habitat removal, "We definitely need to look into the planning procedure that led to this bad decision (because) it lacked transparency....Had this been closer to where people could be, I think they would've backed off," he said, adding, "And they completely kept all media out. They felt like they could get it done without people seeing it... sweep it under the carpet - that's what the difference was.""³³

In reference to the ban on media outlets entering public land, the County gave the reasons that it was a construction site and that it was a construction site.

Avoidable Mistakes

The structure of the flood control system creates a variety of issues, that if discussed with a wider range of input from experts and other players, there might not be so many holes in the system. For instance, the water so desperately needed in an arid Mediterranean climate with an average of five months of drought per year, is swiftly washed into storm drains and sent to the ocean with only a small amount stored for dryer months. Sediment, which would normally make it's way to the ocean to maintain beaches, is trapped behind dams, or deposited into debris basins, and treated like a waste material.³⁴

32 Luciano-Adams, Beige. “Arcadia Woodland Reduced to Kindling, Debate Rages On.” Pasadena Star News 13 January, 2011 Accessed 17 November, 2011

<http://www.pasadenastarnews.com/news/ci_17090390#ixzz1g8UhGvbo>

33 Luciano-Adams, Beige

34 Swift, Cheryl. "Shifting Soil: Sediment Management Policies in Los Angeles." Sediment Management Symposium. Descanso Gardens. La Canada, 20 September 2011. Response Panel.

Former Senator Tom Hayden offered some insights as to what he saw a misstep in the early planning stages of the flood control system, “Instead of adopting "hazard zoning," first proposed 50 years ago by the visionary U.S. city planner Frederick Law Olmstead, myopic Los Angeles officials have zoned millions of people into harm's way, on flood plains and hillsides (not to mention zones of seismic danger).”³⁵

The flood control system also faces other issues that have been created by the narrow scope of the LACDPW – the sole aim of flood control has created a level of fragmentation which has caused numerous disruptions to the flora and fauna of the region. This has led to the need to do double-work in order to correct unforeseen problems that have been caused by a short-sighted system. For example, the structure has had a negative effect on endangered species such as the “Santa Ana Sucker,” a native fish that has found one last refuge in the Big Tunjunga Wash. Shortly after the Station Fire, the state Department of Fish and Game, the U.S. Forest Service and the U.S. Fish and Wildlife Service, had to expedite plans to make sure that fish were relocated in the event that flooding during the storm season caused damage to the ecosystem they inhabited.³⁶

The fragmented nature of the flood control system has resulted in years of controversy for the Army Corp of Engineers and the LACFCD between residents, environmental groups and other government agencies when dealing with issues of endangered species, habitat removal and sediment dumping.

35 Hayden, Tom. “Flood Control by Riparian Rape; L.A. River: We Can't Escape Floods by Pouring Concrete; the Way to Protection is to Work with Nature Not Against It.” LA Times 3 November, 1997
<http://ezproxy.libraries.claremont.edu/login?url=http://search.proquest.com.ezproxy.libraries.claremont.edu/docview/421194919?accountid=10>

36 Sahagun, Louis. “Century-Old Oaks May Make Way—For Silt.” The Los Angeles Times
4 December, 2010. Accessed 18 November, 2011
<<http://articles.latimes.com/2010/jan/18/local/la-me-station-fire-fish18-2010jan18>>

Chapter 3: Barriers to Change

Based on their actions and policies, the County has clearly adopted a “man-vs-nature” approach to ecology. Rather than working with the system already in place, a man-made system has been installed in an attempt to control nature. In the book, *Hazardous Metropolis*, Orsi includes a quote from an early traveler in regards Southern California, “Nature is obstinate here and must be broken with steam and with steel. Until strong men take hold of the State in this way and break it in...”³⁷ And so federal engineers did just that and poured miles of to tame the wild and frequently shifting rivers.

This adversarial tone also filters into the County's dealings with the public. Participants in the County's, Sediment Management Task Force, have criticized the County's lack of transparency and unwillingness to share information, despite forming the task force to improve communication between engineers, construction teams, environmental groups and members of the public. Joshua Link of the Los Angeles water blog, L.A. Creek Freak seemed skeptical about the County's sincerity for including the public in future flood control and sediment management decisions and wondered if it was a matter of PR in order to save face after the Arcadia Woodlands debacle.

The problem in dealing with adversary is that it takes energy away from productive discussions and progressive solutions. The Council for Watershed Health attempted to offer a forum for a comprehensive discussion of the issues encountered with sediment removal, however, the tone of the symposium still suffered from an “us against them” type scenario.

³⁷ Orsi, Jared. *Hazardous Metropolis*. Berkeley: University of California Press, 2003

Short-term planning – Management by Emergency

Even with the history of problems with sediment removal, there has been no comprehensive long-term plan put into place and has only been discussed recently as a option. This has led to managing by emergency when neglecting to empty dams on a regular basis and waiting until a large fire or storm event presents a necessity to remove it in a short time frame to spare the lives and property of residents living downstream.

This method of management by emergency is also a point to consider when looking at current issues with proposed sediment removal projects from the Arcadia Woodlands, Hahamongna Watershed Park and La Tuna Canyon, all of which stem from the overaccumulation of sediment from the Station Fire of 2009. Even though the Station Fire was an exceptional event because of its size and the length of time it burned, it was hardly a surprise since floods and fires are an ongoing part of how the Southern California landscape regenerates and evolves.

This trend was also seen back 1997 when the Los Angeles County Department of Public Works was granted an emergency permit to remove habitat in an attempt to offset the potential damage from El Nino, “Last week the U.S. Army Corps of Engineers gave the Los Angeles County Department of Public Works an "emergency" permit to destroy some 880 acres of riparian habitat in the Los Angeles, Santa Clara and San Gabriel rivers and their tributaries-- nearly every inch of riparian habitat left in the Los Angeles Basin and home to as many as 200 species of birds.”³⁸

38 Hayden, Tom. “Flood Control by Riparian Rape; L.A. River: We Can't Escape Floods by Pouring Concrete; the Way to Protection is to Work with Nature Not Against It.” LA Times 3 November, 1997
<http://ezproxy.libraries.claremont.edu/login?url=http://search.proquest.com.ezproxy.libraries.claremont.edu/docview/421194919?accountid=10141>

Policy Compliance

A troubling issue that has arisen during the County's plans to deal with the sediment after the Station Fire is the content of the Environmental Impact Report (EIR) for CEQA (California Environmental Quality Assessment) compliance. The EIR allows for a study to be done to ensure that flora and fauna in the ecosystems that will be impacted, do not suffer unnecessary removal or destruction.

In May 2009, the LACDPW released the final EIR regarding the proposed removal of the Arcadia Woodlands, called the: Santa Anita Dam Riser Modification and Reservoir Sediment Removal Project. In the Impact Review in Section 4 of the report under “significant unavoidable adverse impacts” the report states, “Two issues have been found to result in significant unavoidable adverse impacts – construction-related noise and global climate change.” The fact that the County is stating that the project will cause “global climate change” is a bold statement as to the negative effects of maintaining the current flood control system. The EIR also listed 4 alternatives which includes their preferred plan involving removal of 11 acres of the Arcadia Woodlands:

The County's “preferred” alternative: A conveyor belt system stretching from the Santa Anita Dam, through Wilderness Park, all the way to the Lower Sediment Placement Site would transfer 500,000 cubic yards of sediment. 250,000 would go to the Middle SPS (aka Arcadia Woodlands) and 250,000 would go to the Lower SPS (already demolished and functioning as a placement site)

Alternative #2 (rejected): Convey to Wilderness Park, truck to Middle SPS (aka Arcadia Woodlands) and Lower SPS

Alternative #3 (rejected): Convey to clearing of Upper SPS, truck all to Manning Pit SPS in Irwindale (opposed by residents because of high number of truck trips through neighborhood via Elkins Ave.)

Alternative #4 (rejected): Convey to Wilderness Park, truck to Manning Pit SPS via Elkins Ave. (same opposition due to truck trips)

Cam Stone's alternative #5: A welcome and coherent counterpoint to the County's "preferred" plan. Stone's alternative would convey 250,000 cubic yards to the Lower SPS as planned, convey 125,000 cubic yards to the Upper SPS (which engineer Bart Stryker found to have adequate capacity), and truck the remaining 125,000 cubic yards to Manning Pit (or other pit in Irwindale) via Sycamore Avenue gate (shorter trip to freeway, far less neighborhood disturbance). This plan is feasible and addresses many of the community concerns while still achieving the DPW's main goal of removing 500,000 cubic yards of sediment from Santa Anita Reservoir.³⁹

³⁹ Link, Joshua "Arcadia Woodlands Update" lacreekfreak.wordpress.com 5 January, 2011
<http://lacreekfreak.wordpress.com/2011/01/05/arcadia-woodlands-update/>

The alternatives were rejected by the County and they decided to go along with their preferred plan. It is unclear if that was due to money or convenience on the part of the County to not explore other alternatives. There was also debate on other compliance issues in regards to the Arcadia Woodlands.

When the County was asked about the compliance with the County Oak Tree Ordinance, they stated in page 3.3-18 of the final EIR: “The City [of Arcadia] stated that an Oak Tree Removal permit was unnecessary for projects requiring oak tree removal for public purposes under Section 9701 of the Arcadia Municipal Code.” The County Oak Tree Ordinance prohibits the removal of oak trees without a permit. The ordinance was written to protect oak trees from removal since they are considered an important resource. As such, the ordinance states: “The Los Angeles County Oak Tree Ordinance has been established to recognize oak trees as significant historical, aesthetic, and ecological resources. The goal of the ordinance is to create favorable conditions for the preservation and propagation of this unique and threatened plant heritage. By making this part of the development process, healthy oak trees will be preserved and maintained.”⁴⁰ The Los Angeles County Oak Tree Ordinance applies to all unincorporated areas of the County. Individual cities may have adopted the county ordinance or their own ordinance which may be more stringent.

Caroline Brown, spokeswoman for the California Oak Foundation, a nonprofit group dedicated to protecting the native trees, “Everyone understands that more debris needs to be removed from the reservoir,” she said. “But there are not many of these once-common coast live oaks left in Los Angeles County except for remnant woodlands like this one.”⁴¹

40 http://fire.lacounty.gov/forestry/EnvironmentalReview_OakTreeOrdinance.asp

41 Sahagun, Louis. “Century-Old Oaks May Make Way—For Silt.” [The Los Angeles Times](#)

The California Department of Fish and Game expressed their concern about the more destructive alternatives in a five page letter (p.284 of EIR) to LACDPW which strongly suggested alternatives 3 and 4 as they would not cause negative impacts to biological resources, which they outlined in their letter:

Under Section 4.2 “Effects Not Found to be Significant” the report states that, “For this project, it was determined that significant impacts would not occur in the following resource areas: Agricultural Resources, Hazards and Hazardous Materials, Land Use, Mineral Resources, Population, Housing, Public Services, and Utilities and Service Systems.” The report then refers to “Appendix A” which gives details as to why the effects were not found to be significant.

During a community meeting organized by the L.A County Department of Public Works on December 16, 2010, Arcadia Woodland supporters voiced their concern with the proposed removal of 11 acres in the Arcadia Woodlands. One of the supporters, Monrovia Planning Commissioner Glen Owens, provided a report that was prepared by an engineer he commissioned, which stated that there were other sediment placement sites that had enough capacity to accept the sediment that was going to be placed. This information conflicted with the County's claims that there were no other sediment placement sites available to accept 500,000 cubic yards of sediment from the Santa Anita Wash. "Unfolding before our eyes is a perfect mistake: County officials without the facts believing that they are doing the right thing,"⁴²

As for the Arcadia City Council, they showed little interest in the fate of the Arcadia Woodlands and did not even have the issue on their agenda the week prior to Woodlands destruction. L.A. Creek Freak blogger, Joshua Link pointed out the irony that the Council did

4 December, 2010. Accessed 18 November, 2011

42 Sahagun, Louis. “Century-Old Oaks May Make Way—For Silt.” [The Los Angeles Times](#)
4 December, 2010. Accessed 18 November, 2011

deliberate for over two years about the fate of one Engelman Oak, compared to the 179 Coast Live oaks and 70 sycamores that were removed in the Arcadia Woodlands.

Chapter 4: Recommendations

The issue of sediment is complex and involves many different factors including habitat removal, the safety of residents and the bureaucratic red tape that seems to halt any real change to the way sediment and flood control system is managed.

Members of the public and even agencies themselves, have criticized the way that sediment is handled and the future of the flood control system. Everyone seems to agree that there needs to be a change. The problem is that even with the Los Angeles County Flood Control District's efforts to put together a Sediment Management Task Force, their leadership of the group has been criticized for lack of transparency and their intentions have been questioned.

Since there seems to be a lack of comprehensive collaboration between agencies, NGO's and the communities affected by sediment removal and deposition, I would recommend a "Community Forestry" model similar to one adopted in an Oregon town after years of serious debate on resource management in the forest. Former adversaries including loggers, environmentalists, timber industry representatives and other members of the community, came together during informal weekly gatherings to discuss the fate of the forest. In their case it had been a matter of holding onto jobs by loggers, a form of income for the timber industry and the fight against habitat destruction for the environmentalists in regards to managing forest resources. This model allowed for people to get to know each other on an informal and personal level and realize that their adversaries were not such bad people. There were even buttons made that said, "No They" in reference to doing away with adversarial language.⁴³

As for the issues with sediment in Southern California, there seems to be some common

⁴³ Kusel, J. & Adler, E. *Forest Communities, Community Forests*. Lanham: Rowman & Littlefield Publishers, Inc. 2003.

ground to start with – a desire to go back to more natural processes and the realization that bureaucratic red tape has become a hindrance to any real change. The group could be made of County officials, engineers, scientists, regulatory agencies, environmentalists and members of the community concerned for safety and truck traffic through their neighborhoods. Ideally some unnecessary regulatory compliance could be relaxed to create a long-term comprehensive plan that would more closely mimic natural processes and prevent millions from being spent every 20 years to empty out dams and debris basins. That notion may seem a bit idealistic, but at least it could be a step in the right direction to real and lasting change.

Future Research

It would be advisable to research more models for cooperative management and perhaps other examples worldwide of flood control issues and solutions to complex bureaucratic structures. It would also be ideal to have an interview with the Los Angeles County officials to discuss their desire for the future sediment removal and how they intend to mimic more natural processes.

Conclusion

The management of sediment from the San Gabriels and the rest of Southern California, is complex with no fast and easy answers. The current reality of the flood control system has many issues that lie beyond the scope of one agency to handle. The fact that communities have been developed right up to the banks of the rivers has left options fairly limited and has left residents open to potential hazards if something goes wrong with flood control system. It is important how it got to this point of removing habitat to dump sediment, which deals with the implementation of the flood control system by capable engineers, but a lack of understanding of the landscape, followed by years of complex regulatory compliances and the lack of input from a wider audience.

Moving forward it is important to know how it got to this point and it is equally important to be able to work with the system that is already in place. While there is no easy answer, the key to long term change is collaboration among agencies, NGO's and the community to look at the region through a holistic lens to discover the interconnectivity in our habitats, communities and our sprawling metropolis as a whole. This will ensure the safety of residents and the protection of vital riparian and native habitats.

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