Ephemeral Design: Capturing Time and Ecological Processes along the Elwha River

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Abstract

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There are many sites undergoing dramatic change as a result of decommissioned infrastructure and industry, or war and natural disaster. These sites, as degraded and disturbed landscapes, are in a state of dynamic flux making more permanent design solutions inappropriate as they would not be sustainable, nor would such an approach foster the transitions necessary to reach a state of ecological health. This does not mean, however, that these sites should be left alone until a more stable state is achieved. In the interim an opportunity exists within this active state, the opportunity to capture time and change through the exposure and interpretation of ecological processes that might otherwise occur so slowly or be so minute as to be invisible to humans.

Ephemeral design holds the potential to make the unknown, both perceivable and comprehensible, and can expose and interpret ecological change prompting visitors to question their surrounding environment, to wonder what is happening on the site and what led to the state of the landscape, and to begin to imagine what the future might be. Through an exploration of ephemerality, this thesis

challenges one of landscape architecture's normative design practices, that of focusing on and valuing duration and longevity. In a quest for longevity ephemeral design is dismissed as inconceivable and unsustainable, thus an untenable design response. However, there are specific sites and landscapes that can be more richly addressed and considered through ephemeral design. In turn, designing for longevity in such places is insensitive to the site and it processes, as it privileges the desire for an immediate and conclusive design solution over the natural processes and systems in place.

This thesis proposes a design response for the former Lake Mills lakebed, adjacent to the recently demolished Glines Canyon Dam along the Elwha River on Washington's Olympic Peninsula. This disturbed landscape was the site of Lake Mills reservoir, that formed from the construction of the Glines Canyon Dam in 1927. After three decades of debate, efforts began in 2011 to remove the dam and restore the lake to a more natural ecosystem, including restored access to salmon spawning grounds. As with all dam removal projects, the consequences of such critical changes in the landscape present both anticipated and unanticipated results. In the case of Lake Mills, there was an unprecedented accumulation of sediment that is both gradually and rapidly, moving downstream thereby shifting the horizontal plane as it moves. To make this process of change visible and to suggest that such dynamic change can play a critical role in design, I propose "reforesting" the lakebed with logs once submerged in the lake, thereby adding a vertical element that calls attention to the shifting of the horizontal plane. Through this design proposal ephemerality is explored as a design response applicable for landscapes undergoing rapid, dramatic, and dynamic change. Furthermore, utilizing ephemerality as a guiding design principle affirms how ephemerality can be employed in similar situations to expose and interpret ecological change over time.

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I would also like to extend a special thanks to my mom for helping me get back on my feet, literally, twice. Her help, support, and cheerleading made this thesis possible. Thanks mom!

PRAYER

I release these salmon
I release

I release my father and mother
I release

I release my sister and brother
I release

I release these salmon
into their personal rivers

the river of bitter root
the river of broken bone

the river of stone
the river of sweet smoke

the river of blood and salt
the river of semen and sap

the river diverted
the river dammed

I release these salmon
I release

I release these salmon
I release

o, salmon, I release you
o, salmon, I pray

o, father and mother
o, sister and brother

return to me
return to me

– (Sherman Alexie, in Duncan 213-214)

INTRODUCTION

> *Decline and decay are [not] to be given free rein indiscriminately, but a more open approach to transience and the traces it leaves would, in the right place, not only help to heighten perception, but also often create new space for the spontaneous, the unexpected, the experimental. Particularly the recent dialogue with the industrial and disrupted landscapes, which are in a constant state of change and subject to the process of erosion and continually encroaching vegetation, is an indication of a new understanding of nature and, in consequence, a different approach to transience.* (Weilacher 40)

My percolating ideas at the beginning of this thesis journey revolved around words. I knew I wanted to study something having to do with time and change, but what was the word that best captured the concept of time and change? Was it:

Impermanent

Ephemeral

Transient

Temporal

Temporary

After unpacking the words, defining them, using them, discussing them, and critiquing them, I finally settled upon the word **ephemeral** to describe what I intended to capture through design. I am intrigued by the fleeting nature of life and the systems within it,

so I set out to explore the ephemerality that goes beyond the changes we witness in our daily lives. Wanting to draw on ephemerality as a design principle to expose and interpret an ecological process, I looked for a site undergoing dramatic change over a relatively short period of time. I postulated that I could more easily identify an ecological process worth exposing and interpreting, one that might otherwise go unnoticed or misinterpreted, on a site that was actively changing. The Elwha River on Washington's Olympic Peninsula met my qualification of a site undergoing rapid change, particularly the area of Lakes Mills.

Beginning in 2011, the largest dam removal project in American history began along the Elwha River. The removal and restoration project is a combined effort involving many different agencies, including but not limited to: National Park Service, Lower Elwha Klallam Tribe, City of Port Angeles, National Oceanic and Atmospheric Administration, U.S. Fish and Wildlife Service, Bureau of Reclamation, Washington Department of Fish and Wildlife, Western Washington University, University of Washington, Peninsula College, Washington SeaGrant, Elwha Research Consortium, and Elwha Nearshore Consortium (Duda, 2011). The National Park Service is overseeing the project and has invested in numerous methods of public awareness including: webcams positioned at different locations along the river to document the dam removal, a blog and Facebook page chronicling the many phases of and people involved in the project, photographs of the different stages of dam removal and restoration, webisodes addressing topics of removal and restoration, and access to a host of press releases, restoration plans, research papers, Environmental Impact Statements and the Elwha River Ecosystem and Fisheries Restoration Act (National Park Service–Elwha River Restoration). Within this abundance of information the National Park Service has also chronicled the varied histories of the area that include the Lower Elwha Klallam Tribe, the development of Port Angeles, Olympic National Park, white and European settlers, the quest for prosperity and human progress, and the native salmon runs that used to call the river home (Sadin and Vogel). This plethora of information about what is happening on the Elwha River keeps those interested in the project aware of the latest happenings and informed of the complexities of this site

and project. While much has been documented about the Elwha's past, present, and what its future might be, my interest lies in the immediate, or near future, of Lake Mills.

Ephemerality means fleeting, and this thesis explores a deliberately ephemeral design approach. I believe there are sites, like the Elwha, that are undergoing dramatic changes as a result of infrastructure, industry, war, or natural disaster, that might benefit from ephemeral design. These sites, for some period of time, will continue to remain in a very active state of flux thereby making more permanent design inappropriate. For example, a more permanent design on such a site might be almost immediately re-shaped or damaged by the more powerful forces of change. Or, rather than being re-shaped by the site, a more permanent design might instead interfere with the naturally occurring processes resulting in a disturbance to the integrity of the site. Furthermore, once a site in the midst of dramatic change reaches a more "stable" state, this more permanent design initially responding to the site as it was, would be out of place, no longer relevant to the site as it currently exists.[1] This does not mean, however, that these sites should be left alone until a more stable state is achieved. I believe an opportunity exists in this active state, the opportunity to reveal time and change through the exposure and interpretation of ecological processes that might otherwise occur so slowly or be so minute they are invisible to humans. Ephemeral design has the potential to make the unknown, perceivable and comprehensible, to encourage the visitor to question what is happening around them so that they wonder what led to this state, and to imagine what the site's future might be. These acts of questioning and discovery help the visitor understand the site more fully as well as its relationship to the larger

1 Although I use the term "stable," I use it as a relative term and do not mean to infer that any site is ever literally "stable." Over the past 30 years, the study of ecology has experienced a paradigm shift as ecologists have redefined the way they interpret ecological systems from a static system trying to reach equilibrium to a dynamic system that is continually in flux. Ecosystems are now interpreted as "open systems" that function "in less predictable ways than had previously been thought" (Hill 142). Ecologist "Steward Pickett has referred to this [open system] as the non-equilibrium paradigm," in which "a stable state does not exist in living systems and, instead, that a 'meta-stable' set of conditions constantly disappears and reappears" (142).

watershed and the region, in both a specific and more general way. Making these connections establishes a broader sense of place, one in which we, as humans, feel bound and linked to our environment. Futhermore, if the visitor can see and comprehend that the dam was a human mark upon the landscape that altered the ecosystem in which it was set, then there is the possibility that the visitor might also begin to question and understand that their own marks upon the landscape (e.g. resource consumption, waste, and disposal) will also have consequences, both postive and negative.

THEORY + LITERATURE

In order to propose a deliberately ephemeral design, grounded within the practice of landscape architecture, I examined the existing literature and theory on the ideas and applications of ephemerality, Land Art and site-specific art, ecological design and literacy, and the attitudes and practices of design in industry and restoration related to my site. With this theory and literature in mind, I situated my design response within both the gaps and overlaps of these areas of knowledge.

Ephemeral design presents an alternative to what I see as landscape architectures's normative design method that focuses on and values duration and longevity. This privileging of the permanent, is reflected in the materials, maintenance schedules, funds allocated a project, and the common and shared thinking about a design's lifespan and its relative value. In a quest for longevity, ephemeral design is underutilized, frequently not even considered a design method. There are specific sites and landscapes, however, more suited to a framework that privileges ephemeral design; in fact, designing for longevity in such places is inappropriate, perhaps even irresponsible.

Given my fortunate disconnect from the realities of a client-based project, I did not have to contend with the constraints of budget, time, client's needs and desires, permitting, competing interests, and all the things that set the parameters of a built project. I was free to set my own design parameters based on my interests and the site, rather than being bound by real world constraints. That being said, I did set out to propose a design that, although conceptual, could be envisioned for this site and would initiate discussion about ephemeral design and its role in landscape architecture as a worthy and feasible approach to design.

Ephemerality: time and change

> *[The] intrinsic beauty of landscape resides in its change over time* (Meyer 19).

> *Time is the crucial dimension of landscape, [and] change is the direct byproduct of time* (Treib 37).

In the landscape, time is manifested in plant growth and decay, material change, seasonal cycles, weather patterns, species migration, etc. While it is relatively easy to perceive these manifestations of time within the landscape, other temporal changes are not as easily comprehensible. Some ecological changes occur at such a slow or fast rate that they are imperceptible to humans. Other changes occur at such a small scale that they are invisible to humans. Time, however, is relative to the processes that shape it, and those that experience it (Spirn 89). Time is a measurement device, and the representation of life's beginning, end, and continuance.

Perception is what guides our comprehension and understanding of our environment, and scale and time affect our perception. According to Ann Winston Spirn, if "the human life span were a day, flowers might seem as enduring as rocks, if we lived a thousand years, rock might seem mobile" (99). It is an illusion to think of the landscape as static, but human time and scale can prevent a fuller comprehension of nature's time and functioning. If we are aware of time and change in the landscape, however, we can more intuitively see the connections between ourselves and natural systems. Time and change can serve as the device that helps us understand our environment and its underlying ecological processes and systems.

Landscape architect J.B. Jackson posited that landscape is "'a space deliberately created to speed up or slow down the process of

nature … it represents man taking upon himself the role of time'" (Herrington 8). In the case of this thesis, design is meant to expose time as an active agent of the landscape rather than speed it up or slow it down. In this respect, landscape frames time in space and provides an opportunity for us to witness ecological processes in action. The transient nature of landscape, its systems and processes, reflects the transient nature of life and human mortality.

Despite the fact that all landscapes are ephemeral, at times designers have gone to great lengths to change our perception of time in the landscape. Brooklyn's Prospect Park for example is a highly manipulated landscape despite the fact that it appears "natural." Figs. 1 and 2 Similar to Central Park, the 1860s Prospect Park, a former farm, was designed in the pastoral and picturesque styles and required extensive manipulation of the landscape. The park's designers Frederick Law Olmsted and Calvert Vaux, rather than waiting for natural processes to take their course—the growth of grasses, shrubs, and evergreen and deciduous trees over the course of decades—instead transplanted many of the large shrubs and trees from both other parts of the farm and from outlying properties (Herrington 8). The result was that when the park was opened to the public it appeared much older than it actually was; Olmsted and Vaux had in effect sped up time. Susan Herrington argues that this manipulation of time is not necessarily a bad thing, because in this toying with perception we tap into the past, present, and future manifested in memory, imagination, and anticipation (8).

Fig. 1 Prospect Park
Frederick Law Olsmted and Calvert Vaux

Fig. 2 Prospect Park
Frederick Law Olsmted and Calvert Vaux

Fig. 3 Back Bay Fens
Frederick Law Olmsted

Olmsted's design for Boston's Back Bay Fens in the late 1800s engaged time and change in a way that was as much about function as it was about aesthetics. Prior to Olmsted's involvement, the Back Bay Fens was a stagnant saltwater marsh polluted by urban sewage and an adjacent mill (City of Boston.gov; Emerald Necklace Conservancy). In keeping with the predominate paradigm of the time, Back Bay Fens was designed in the pastoral and picturesque style. Rather than manipulating time, however, Olmsted's design incorporated time and change by allowing for fluctuating tides and floods and incorporating plants that would not only withstand these changes in water level but also cleanse the water (City of Boston.gov; Emerald Necklace Conservancy). Through this design Olmsted created a natural water treatment system that still appealed to the pastoral and picturesque sensibilities of the time. Fig. 3.

Since Prospect Park and Back Bay Fens, designers have begun to incorporate time and change in their designs that serve multiple functions and work *with* time and change. Today many designers attempt to anticipate change and allow for some level of indeterminacy. As designers come to think of landscapes as systems, manipulating and controlling the landscape becomes less important. Rather than hiding or strictly controlling ecological processes, many designers are interested in exposing them and allowing them to function more naturally

so that people can understand how ecosystems work. For example, designs can be flexible to allow for floods or drought such in Allegheny Riverfront Park and Mill Race Park by Michael Van Valkenburgh Associates or Guadalupe River Park by Hargreaves Associates. All of these projects allow for storm and seasonal flooding. Figs. 4, 5, 6, and 7. Rather than building structures to keep the rivers at bay, plants and hardscapes that can withstand periodic flooding serve as the very backbone of these designs (Michael Van Valkenburgh Associates Inc.; Hargreaves Associates). The ephemeral rise and fall of water levels is embraced in these projects and made visible to visitors. Another project, conceptual in nature, also embraces time and change, envisioning how environmental forces and phenomena can be allowed to take their natural course without constraint or damage to humans or property. In SOAK: Mumbai in an Estuary, Anuradha Mathur and Dilip da Cunha conceive a future for Mumbai that accepts monsoon flooding and tidal changes as natural phenomena of an estuary and imagines the city as a sponge able to absorb and dispense this excess water through design solutions that are based on uncertainty and change (SOAK). Figs. 8 and 9. These projects are examples of a growing appreciation for landscapes that change over time.

Fig. 4 Allegheny Riverfront Park
Van Valkenburgh Associates Inc.

Fig. 5 Guadalupe River Park
Hargreaves Associates

Fig.6 Mill Race Park
Van Valkenburgh Associates Inc.

Fig. 7 Mill Race Park flooded
Van Valkenburgh. Associates Inc.

Ecological Design and Literacy

> *Processes connect, literally, physically, and figuratively; if we can read them, they make sense of events apparently unrelated* (Spirn 92-93).

In Sustaining Beauty, Ann Winston Spirn suggests that landscape design has the potential to be,

> an aesthetic that celebrates motion and change, that encompasses dynamic processes, rather than static objects, and that embraces multiple, rather than singular, visions. This is not a timeless aesthetic, but one that recognizes both the flow of passing time and the singularity of the moment in time, that demands both continuity and revolution. This aesthetic engages all the senses, not just sight, but sounds, smell, touch and taste, as well. This aesthetic includes the making of things and places and the sensing, using, and contemplating of them (8).

Here we see that the perception of time and change is dependent not simply on our ability to see but rather on more complex aspects of perception and experience within the landscape. It is the experiential nature of landscape that reveals time and change, or ephemerality, encouraging the visitor to question their environment and surroundings.

Fig. 8 SOAK: Mumbai in an Estuary
Anuradha Mathur and Dilip da Cunha

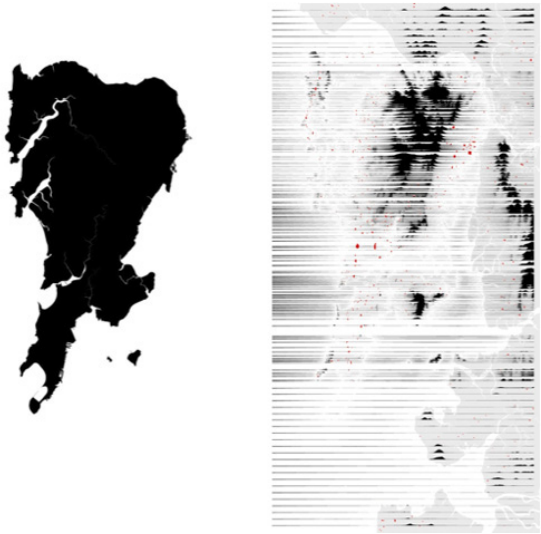

Fig. 9 SOAK: Mumbia in an Estuary
Anuradha Mathur and Dilip da Cunha

Our physicality within landscape influences our knowing and understanding of it; our bodies facilitate our perception of time and change (Meyer 15). A three dimensional experience of landscape is different from other experiences that do not involve all the senses, such as looking at a painting or listening to a story. Physically being in the landscape, occupying it, moving in it, and through it provides a different level of awareness, a more complete experience of that landscape as we come to know it through all our senses. By being there in space and time, in our bodies, an act as simple as turning one's head can radically change that experience (Chenoweth and Gobster 2). We can see, feel, hear, touch, and even taste the elements that make a particular landscape unique. Through this way of experiencing and processing the landscape we come to know it and understand it in more thorough and intimate way from simply seeing it (15).

A primary interest in many landscape architecture projects is longevity, in both design and materials. Although longevity is an important aspect of many projects, and Udo Weilacher claims, that our urban environment "requires an emphasis on objects and permanence," longevity and permanence are not necessarily desirable or optimal for all projects and sites (34). Some places and situations, such as post-infrastructure, post-industrial, post-natural disaster, and post-war, may be better suited for more ephemeral design solutions. In certain situations, deliberately designing for impermanence by allowing and encouraging the processes of time and change to interact with and shape the design can expose ecological processes, systems, and relationships. This exposure to the workings of natural processes and systems can more fully engage the visitor providing an opportunity for them to witness change as it happens and experientially engage with landscape leading to a more thorough understanding of and connection to the environment. A fuller comprehension of ecological systems and processes, and their relationships, can encourage the visitor to see themselves as a part of these systems and process.

New theories in ecology over the last 30 years have taught us that "life upon the planet is so deeply bound into dynamic, complex, and indeterminate networks of relationships that to speak of nature as a linear mechanism, as if it were a great machine that can be either intrinsically or extrinsically controlled and repaired, is simply erroneous and reductive" (Corner, "Ecology" 83). Ecologists and designers alike understand that humans, moving through and inhabiting landscapes, contribute to ecological dynamism and that excluding humans from ecology damages both ecosystems and humans (Brown 65). According to Ann Winston Spirn, "[a]ll living things share the same space, all make landscape, and all landscape, wild or domesticated, have co-authors, all are phenomena of nature and culture"; humans and ecosystems are intrinsically linked and it is design, particularly ecological design, that has the potential to expose these connections (127).

Elizabeth Mossop and James Corner argue that the merging of ecology and design has yet to be fully realized and that this inability to merge the two disciplines has, according Mossop, "pitted art, design, and development on one side and planning, ecology, science, sustainability, and conservation on the other" (169). Despite this failed merger, the potential benefits of such a marriage require our continued efforts at bridging the gaps between these two, seemingly different, disciplines. In support of this idea Corner suggests that a design/ecology synthesis has the potential to "invent alternative forms of *relationship* between people, place, and cosmos" and provide design solutions that address multiple aspects of a site (aesthetic, ecological, cultural, historical), rather than a single aspect (Corner "Ecology" 82-83). Together ecology, art, and landscape architecture can expose the connections between humans and ecosystems and address issues related to visual appearance, resource value, habitat structure, or instrumentality (82-83). This thesis draws inspiration from ecological design as well as art, resulting in a design that is both art and landscape architecture, and one that attempts to bridge, albeit in a small way, ecology and design. My hope is that the design I propose, encompassing both art and ecological design, will facilitate a deeper understanding of the site and the visitor's relationship to it.

Land Art and Site-Specific Art

> *The artist who works with earth, works with time* (Walter De Maria, in Weilacher 21).

I have long been drawn to Land Art, attracted to the way many land artists have engaged time and change and tackled ideas about ephemerality. Land Art came to fruition in the late 1960s out of, and in response to, the social, cultural, economic, and political events of the 1960s and 1970s. Land artists pushed the boundaries of what was art, its materials, how it was viewed, and where it existed. Particularly in America, the most radical and iconic Land Art pieces are site-specific, remote, and existing in and of the landscape.

Common themes emerged amongst the land artists including: site, time, entropy, history, culture, consumerism, the traditional art world, the physical and conceptual nature of art, and the creation of place and experience. For many artists, Land Art started as a "protest against the artificiality, plastic aesthetics and ruthless commercialization of art" (Weilacher 11). This protest inspired many land artists to change the way they worked; employing scale in a revolutionary way, they designed pieces that were too large to fit into the traditional gallery or museum space and too large to be thought of as an object of purchase (Boettger 37). These large scale artworks were anti-museum, anti-collector, and anti-establishment (37). Constructed out of materials from the land, such as dirt, water, salt, and boulders, further contributed to the unpurchasable nature of the work.

The remote locations, and often ephemeral nature of Land Art, prevented most of the public from experiencing or interacting with the works. Instead, the work was documented through photography, film, or printed media and then exhibited and sold in galleries, museums, and online. Although their work was displayed two dimensionally in galleries and museums, land artists primarily worked three dimensionally; their work was deeply rooted in the specificity of place with sites chosen based on the following criteria: materials, the amount of space needed, freedom from land use regulations, and optimal location in regards to geological, cultural, spiritual, mythical, or astronomical conditions.[2] The selected sites were often seemingly void of human occupation, although not

2 Typically, three dimensional art has been considered sculpture, and although the land artists challenged this notion they also borrowed from new ideas about sculpture. In the 1960s sculpture captured a new following and dominated the art scene as never before in the modern world (Boettger 32). As Boettger describes, "sculpture had traditionally maintained a vertical stance, akin to that of a standing person," but with the growth of Minimalism, sculpture "began to assume the horizontal position, parallel to terrain" (34). The new horizontal nature of sculpture allowed art to address landscape's horizontalness in a new and different way. For example, early land artists showed their work in galleries and museums. This work was often comprised of one, or a series of, low sculptures on the gallery floor composed of landscape materials brought into the gallery from outside such as Smithson's A Non Site, Franklin, New Jersey and Robert Morris's Earthwork. This type of sculpture related directly to the shape, size, and materiality of the landscape; the pieces were not only about the form they encompassed within the gallery but also, and perhaps even more so, they were about the landscape from which they came from, outside the gallery walls.

devoid of cultural significance or influence. For example, Robert Smithson's Spiral Jetty is located in an area of the Great Salt Lake that was a former tar mine and according to local legend the lake was connected to the sea via underground channels that formed a vast whirlpool (Tufnell 41); Nancy Holt's Sun Tunnels is located in the Utah desert where the tunnels correspond to the celestial constellations, Draco, Perseus, Columba and Capricorn and line up with the rising and falling sun of the summer and winter solstices (The Center for Land Use Interpretation); James Turrell's Roden Crater is located in the Arizona desert within an extinct volcanic cinder cone that sits 400 feet above the horizon with an uninterrupted view of the vast sky above (James Turrell). Figs. 10, 11, and 12. Land art pieces were often remote, making them inaccessible to the public or requiring elaborate travel and overnight stays for visitation. Some works were deliberating ephemeral, designed to exist within a fleeting moment of time—lasting days, weeks, months, or only seconds—and then disintegrate into the landscape from which they came (Tufnell 81). Working in the landscape and using materials from the land, enhanced the ephemerality of the work.

Fig. 10 Sun Tunnels
Nancy Holt

Land Art, and site-specific art, frequently addressed time and change through the transient nature of the materials changing, breaking down, and decaying over time (Weilacher 21). The use of overtly ephemeral materials such as water, rocks, soil, and salt, ensured that artists had no control or mastery, not even perceived, over their work. This acceptance of time and change, rather than resistance to it, was central to many artists' work; work that deliberately incorporated ephemerality into the concepts, designs, and materials.

Fig. 11 Roden Crater - outside
James Turrell

Several artists influenced my early thinking as I began to explore time, change, and ephemerality and include: Robert Smithson, Walter De Maria, Gordon Matta-Clark, and Christo and Jeanne-Claude. Each of these artists approached time and change differently and provided me a lens through which to explore ephemerality. I will introduce these artists and briefly describe how each artist's work and methods contributed to my thinking. [3]

Fig. 12 Roden Crater - inside
The Crater's Eye
James Turrell

Robert Smithson

Robert Smithson is likely the most well known of the land artists. Throughout his short career he not only made one of the most iconic and enduring pieces of Land Art, Spiral Jetty, but he also wrote extensively about his art and his ideas and dabbled in film. Smithson was deeply interested in time, change, entropy, and decay, and these ideas permeated his work. His most famous work, Spiral Jetty, is located on the northeastern shore of the Great Salt Lake near Rozel Point in Utah. As the name implies, it is a great spiral, 1,500 feet long and 15 feet wide, that juts out into the lake in a counterclockwise coil. Fig. 13. Smithson was intrigued with his chosen site because the water's reddish hue and the site's industrial past.

3 Many people are familiar with the work of artist Andy Goldsworthy; I am familiar with much of his work and his movie Rivers and Tides. While I find his work visually compelling, I was drawn to work that, for me, has more conceptual complexity, relies less on aesthetics, and engages ephemerality and the landscape in less obvious ways.

Fig. 13 Spiral Jetty
Robert Smithson

Two things make Spiral Jetty a compelling precedent for my project: 1. the water levels in the Great Salt Lake fluctuate enough that at times, sometimes many years, the Jetty is completely submerged, and 2. the high salt content of the lake has changed the Jetty over time as salt crystals have increasingly formed on the basalt boulders that make up the Jetty. Fig. 14. The Jetty's emergence and disappearance has increased the mystique of the work as it emerges from the lake during low water cycles only to disappear again during periods of high mountain runoff. In this respect, ephemerality is understood in the emergence and disappearance of the Jetty, no one ever knowing how long the Jetty will be visible or invisible. The salt crystals that have formed on the black boulders have changed the appearance of the Jetty, altering its color, now more white than black, and texture and contributing to the Jetty's meaning. The salt crystals "grow" out of the lake, attaching themselves to the rocks, forming as Smithson noted, a spiraling crystal molecular lattice that echoes the spiral of the Jetty (Smithson 147). The changes that occur to the Jetty due to changing water levels and salt crystals, lend the work an unpredictable nature that I am drawn to. I appreciate the sense of unexpectedness that adds mystery and intrigue to the work. Although the work was completed in 1970, it continues to change in relatively unforeseen ways that are out of human control. These changes keep the work fresh and interesting; something new can still be found in it.

Fig. 14 Spiral Jetty
Robert Smithson
Salt crystal formations covering the Jetty's boulders

Walter De Maria

Walter De Maria was a pioneering land artist in American and a colleague of Robert Smithson. He was a musician and an artist and shied away from the limelight his work afforded him. His most icon piece, The Lightning Field, is located in a remote area of western New Mexico, and in keeping with De Maria's preference for solitude, is set on a vast open plain that can only be visited with an overnight reservation. Arranged in a grid 1km by 1 mile, The Lightning Field is composed of 400 stainless steel poles averaging a height of 20 ½ feet tall, and spaced 220 feet apart. Fig. 15. Remarkably the poles are all at the same height despite the undulating terrain underneath them. The poles are meant to attract lighting, bringing together earth and sky (Beardsley 227).

This work is also ephemeral, not being entirely complete until lightning appears. Fig. 16. This work gave me yet another way to think about ephemerality and an unpredictable element outside of human control, such as the weather, that acts upon the work. Without lightning Hogue argues, the work is unfinished, a series of poles in the landscape awaiting completion (59). I, however, am struck more by the poles themselves than by the art work they complete upon lightning strike. The order, artifice, and size of De Maria's grid upon the untouched landscape is similar to the grid I place upon Lake Mills. De Maria, like me, was concerned with marking and measuring the landscape in a seemingly unnatural way and with materials that were foreign to that landscape. Furthermore, I am

drawn to this work for its dichotomy of strict order and uncontrollable phenomena.

Gordon Matta-Clark

Gordon Matta-Clark was trained as an architect at Cornell but during his short life he was an artist and restaurateur. He was attending Cornell during the seminal Earth Art exhibit curated by Willoughby Sharp in February 1969 (Lee 37). There he met the land artists participating in the show (Robert Morris, Michael Heizer, Dennis Oppenheim, Hans Haacke, Jan Dibbets, Neil Jenney, Richard Long, David Medalla, and Gunther Uecker and Robert Smithson) and even helped some of them build or install their pieces. He was particularly influenced by, and became friends with, Robert Smithson and Dennis Oppenheim (37).

Matta-Clark, along with Smithson, was deeply interested in entropy, which stems from the Second Law of Thermodynamics; entropy is "a dissipating force within the universe, driving the physical world from a system of order to maximal disorder" with the "temporal dimension of entropy [being] understood as irreversible, correlative to the progressive disintegration of

Fig. 15 The Lightning Field
Walter De Maria

Fig. 16 The Lightning Field during lightning storm
Walter De Maria

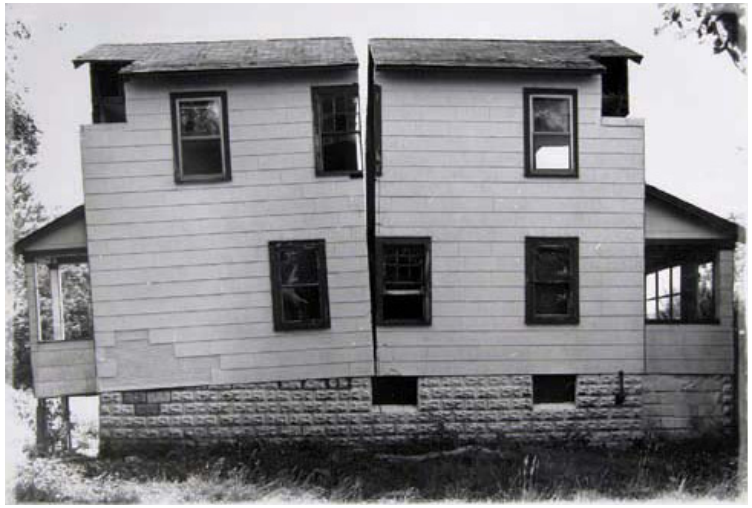

Fig. 17 Splitting
Gordon Matta-Clark

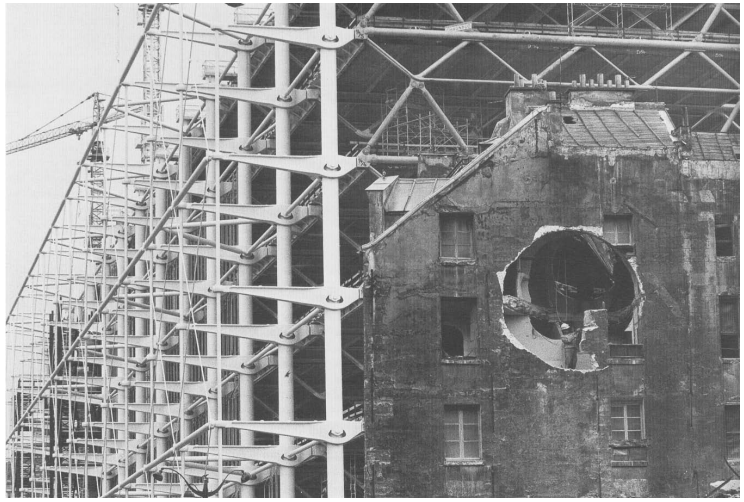

Fig. 18 Conical Intersect
Gordon Matta-Clark

form" (39). With entropy in mind, both Matta-Clark and Smithson were equally concerned with the processes of making art and the subsequent decaying of that art. They understood time as the "non-material dimension of space," and their work captured the "visual expression of the process of time, as a metaphor of the discontinuity of phenomena, as recognition and manifestation of the phase of decay in the natural cycle of life" (Weilacher 21, 40).

Matta-Clark's most widely known work involved the cutting of buildings slated for demolition. Figs.17 and 18. For Matta-Clark, the "notion that the object is made at the moment of the building's ruination—the work's simultaneous self-effacement as it comes into presence—suggests that it actually 'rises into ruin,'" (an expression of Smithson) (Lee 46). This ruination is particularly evident as Matta-Clark took a chainsaw to the buildings awaiting demolition—conscious of their imminent ruin, he adds to their destruction by cutting them apart. His cuts simultaneously create the art work and destroy it. Choosing to work this way, Matta-Clark directly addressed the transient nature of not only art and the built environment, but also of life in general. What better way to impart a meaningful understanding of ephemerality than to actually work with

fleeting materials and within a fleeting time frame to create something fleeting.

Although many critics found Matta-Clark's approach to ephemerality violent, as he literally cut buildings in half, his work can also be described as amusing. Matta-Clark was interested in word play, and his cuttings appear to form physical manifestations of word plays: dismantling to construct, destroying to build, unmaking to make. There is also a hint of preposterousness to his cuttings, the very act of destroying something to make something, and something that will in the near future be demolished. It is a cyclical method not unlike the method I employ in my design to "reforest" Lake Mills. Furthermore, Matta-Clark's approach to ephemerality is bold, as he employs time and change directly rather than subtly. His work explored ephemerality, not only in the work itself, but also in the making and un-making of the work.

Christo and Jeanne-Claude

Many people are familiar with the work of Christo and Jeanne-Claude. The two are renowned for their large scale, outdoor, temporary installations and interventions Their work, however, is more than simply the installation itself. Many, many years of work go into each of their projects involving: planning, permitting, funding, government and community approval and support, in addition to conceptual development, design, and artifacts created to sell the project to decision makers and pay for the project. All of this work is

Fig. 19 Valley Curtain
Christo and Jeanne-Claude

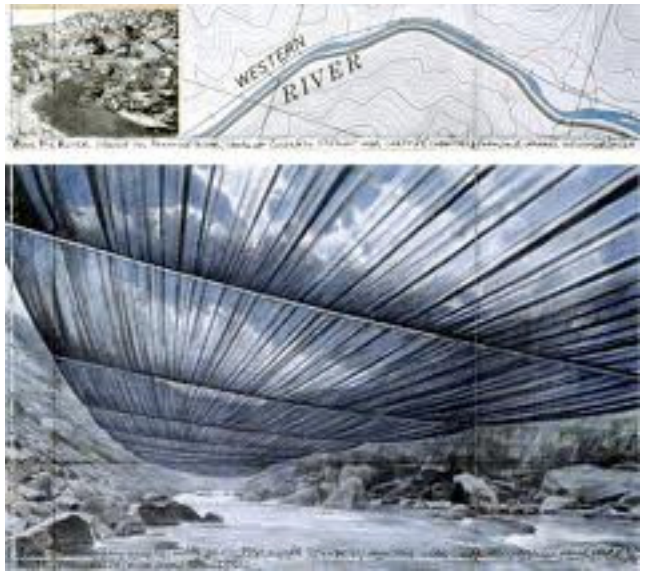

Fig. 20 Over the River
Christo and Jeanne-Claude

thoroughly and meticulously developed and recorded revealing how each project is as much about the process as the finished work. Studying their meticulous drawings, detailing every aspect of their projects, helped me work through the details of my own design. Despite the fact that this thesis is conceptual, referring to Christo and Jeanne-Claude's work, Valley Curtain and Over the River in particular, revealed the level of detail necessary for my design to be legible and plausible. Figs.19 and 20.

Although endless hours, days, and years go into Christo and Jeanne-Claude's projects, the work is ephemeral, only in place for a brief period of time, then dismantled to exist solely in memory and photographs. In contrast to the other artists mentioned, Christo and Jeanne-Claude's work is not demolished nor does it decay in situ. This type of ephemerality, that is based on the limited time that the work exists rather than in the natural breaking down and decay of materials, provided yet another example of how to design with ephemerality. Similar to De Maria, the beauty of Christo and Jeanne-Claude's work lies in the experience and the memory of it rather than the longevity of it.

Art or Landscape Architecture

> *Art and landscape architecture are the same thing for me. There's no difference* (Lassus 109).

There is an unmistaken ambiguity between art and landscape architecture—an endless debate, and an important one. Landscape architecture is often coined as the merging of art and science with disputes arising as to how much art or how much science. Landscape designers possess a breadth of knowledge, from multiple disciplines, making it is difficult to concisely identify what landscape architecture is. In fact, it is many things, including art. This thesis does not attempt to reconcile this difficult question but rather is, in my mind, a merging of art and landscape architecture. Despite the fact that art is a component of this thesis, however, my role as the designer comes consciously and primarily from my understanding of landscape architecture, with assistance from my background in art. That being said, this thesis is a culmination of my landscape architectural studies and the synthesis of what I have learned about landscape architecture.

Industry and Progress: Nature to be tamed and consumed

> *There is something about belonging to a place. You want to control more and more of it, directly or indirectly…land was something one could work with, change, develop* (Thomas T. Aldwell, in Crane 43).

Two themes defined much of 19th century America: westward expansion and industrialization. With the desire to expand the American empire, many moved West with dreams of prosperity. Westward expansion was closely aligned with freedom, independence, and human progress (The Library of Congress, America's Story). Most early Americas were farmers which was deemed a noble and moral pursuit reflecting freedom, independence, and prosperity (Herrington 34). With farming came the idea that the landscape was wild, yet productive. In order to make full use of the land's productiveness it must first be domesticated. This idea encouraged the implementation of the Public Land Survey System so that land could be measured, mapped, allocated, and sold to individuals as

property and possession. Once land rights were established, a settler could begin the task of turning wild land into productive land (Sadin and Vogel 24).

Although Europeans explored the waters along the Olympic Peninsula in the 1500s, it was not until the late 1800s that some of the earliest settlers began claiming land along the Elwha River (Crane 37; Sadin and Vogel 21). All along the river, hardy settlers cleared land for small orchards and farms, and lived off the land much as the Lower Elwha Clallam Tribe did, hunting and fishing (Sadin and Vogel 32). This way of life was in itself ephemeral; once the means to maximize nature's profitability was established, the drive for human progress and prosperity was fully unleashed.

As industrialization made its way from England to America in the 19th century, the role of the landscape, particularly for those seeking prosperity, began shifting from mostly agrarian to industrial (Crane 40). Nature and land were not only wild and in need of taming, but more than ever they were also seen as a commodity to be bought and sold (42-43). Particularly in the Pacific Northwest there seemed to be a never ending abundance of natural resources that could be harnessed for human use (46, 54). Logging and fishing were the primary industries of the Pacific Northwest; the forests were there to be logged, the fish there to be caught and canned, and the rivers were there to supply energy for those two industries. Although at this time, nature was also seen as beautiful, inspiring, and sublime, boosters and businessmen of the Pacific Northwest thought its primary purpose was to serve human needs (44).

Although conservationists and preservationists of the time attempted to control runaway capitalism with laws restricting the overexploitation of resources, the enforcement of those laws was weak in the further reaches of the Nation such as the Pacific Northwest (54) . The apparent abundance of natural resources in the Pacific Northwest made them seem timeless; they had always

existed and always would. The need to regulate and limit the logging and fishing industries, which the conservationists argued for, could not outweigh the prosperity these industries seemed to promise, especially in light of the area's adundant natural resources (54). Instead of limiting resource use and extraction, mills and canneries sought the electricity necessary to develop further. Outsiders also contributed to the Pacific Northwest's exploitation of resources: investors outside of the region controlled the logging industry in Port Angeles (52). Essentially the money for industry flowed into the region while the natural resources flowed out. Ignoring the inherent ephemerality of these natural resources, the idea of timelessness prevailed and the Elwha River was harnessed to provide hydroelectric power to Port Angeles and its industries.

Environmentalism: Nature to be protected, managed, and restored

> *...no person, no family, no country, and no civilization in history has remained viable for long without engaging in corrective acts of self-criticism, self-sacrifice, and restoration* (Duncan 197).

The exploitation of natural resources in the name of industry and progress was common for industries like logging and fishing in the Pacific Northwest in the late 19th century and early 20th century. The Progressive Era of the late 1880s to early 1920s, however, attempted to "curb the worst excesses of capitalism" (Crane 67). Conservationists and preservationists were aware of diminishing resources and their finiteness and attempted to protect them. In fact, as early as 1890 Washington law required fish passages for dams (55). Both the Elwha Dam and Glines Canyon Dam should have been built with fish passages. Despite the law, however, these dams were built without fish passages and enforcing the law was nearly impossible: laws designed to protect natural resources "commanded little support in resource-extraction-dominated economies and legislatures" of the Pacific Northwest during the late 19th century and

early 20th century (55).

Since the late 1960s, however, there has been a renewed interest in environmentalism and attitudes towards the environment have changed significantly. Fueled by Rachel Carson's book *Silent Spring,* American's took a new interest in protecting the environment. The use of DDT was restricted, while Earth Day, the Wilderness Act, the National Trails Act, and the Clean Air Act were established. The Sierra Club flourished and other environmental organizations sprang up. There was a growing appreciation for the wilderness and a "renewed interest in the pastoral" (Boettger 41). Songs were written about the environment, and American's cultivated a romantic idea of nature as an escape from urbanism and industrialization. Nature was once vast and limitless, a thing to be tamed and cultivated (Beardsley 7). Now, however, due to industrialization nature was fragile and in need of protection and management (Thornes 402).

Today, Americans are concerned about ecosystem restoration as well as the protection and management of the environment.[4] This attitude is evident in the massive Elwha River restoration project which, according to the Olympic National Park's restoration plan, began in 2002 and continues until 2024 (Chenoweth et al. 36, 102-104). This plan involves pre-dam removal studies and mitigation, and post-dam re-vegetation, invasive plant removal, and monitoring, all to be conducted by the National Park Service, the Lower Elwha Klallam Tribe, scientists, specialists, and volunteers. As will be discussed in more detail in later chapters, the Elwha Dam has been completely removed with no structures remaining. The Glines Canyon Dam is 60% removed and still retains its 5 spillways and thrustblock; the final plan for these structures is unknown. Through the massive restoration efforts and the fact that nearly all of the

4 This is not to insinuate that Americans do not continue to engage in behavior that is deleterious to the environment. Rather, I am simply expressing that in 2013 Americans' attitudes towards the environment are, relative to the early 20th century, less about domination and exploitation. There is much dialogue today, presumably more than in the early 20th century, about ways in which to improve the environment and lessen our impact on it. Americans have also come to the realization that our natural resources are not infinite and steps are being taken to use our resources more wisely and in a sustainable manner.

dam structures have been removed, it appears that the dams and their damage are being erased from the landscape.

This design proposal for Lake Mills lies somewhere between the early 20th century thinking and today's thinking. While I am in favor of the restoration efforts, I am also uncomfortable with methods of erasure. The history of the Elwha River, including the dams which have had a monumental impact on the ecosystem, Lower Elwha Klallam Tribe, and residents of Port Angeles, offers rich stories and narratives that might be valued by future visitors as well as the larger community. History should be impartial, telling all sides of the story, including the less favorable parts that we wish to forget. Leaving some dam structures in place and retaining some of the marks left on the landscape tells a more complete history of the area. We cannot, and should not, deny that the dams and their affects are part of our local, regional, and even national history. Furthermore, we are quick to forget and a constant reminder of the consequences of our human actions can only encourage us to make less destructive decisions in the future. That being said, the design proposed here takes into account multiple histories of the site and is intended to interpret changes taking place on Lake Mills in a way that attempts to avoid intentional harm to the landscape while providing an ecological benefit. This benefit includes returning much needed nutrients and habitat to the lower river, below the dams, as well as establishing new habitat within the lakebed. Through the use of ecological design and site specific design, an alternative interpretation of the Elwha River and Lakes Mills is outlined in the following chapters.

HISTORY + SITE ANALYSIS OF LAKE MILLS

Well I have heard stories from my dad that Grampa Phil said the fish use to come in so thick that you could walk across the river on their backs. Then when the dams went in with no fish ladders it broke so many peoples hearts

(Ben Charles Jr. – Lower Elwha Klallam Tribal member).

The Elwha River is located on the northern coast of Washington's Olympic Peninsula. Just west of Port Angeles, the river runs 45 miles from the heart of the Olympic Mountains to the Strait of Juan de Fuca. Fig. 21. The Elwha watershed is nestled deep within the mighty forests the Pacific Northwest is known for, and 83% of the watershed is located within the Olympic National Park (Duda 1, 2008). Fig. 22. The Lower Elwha Klallam Tribe has inhabited the watershed since time immemorial, living off the area's abundance of natural resources, particularly the various native salmon runs who called the Elwha River home (1). These salmon were crucial to tribe's existence and way of life.

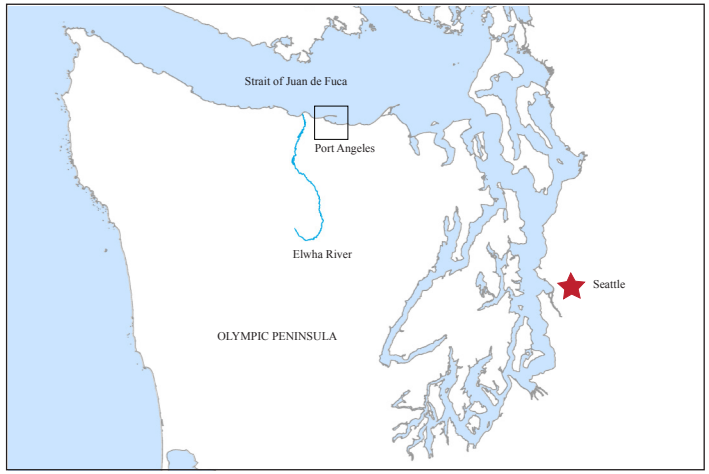

Fig. 21 Elwha River - state and regional context graphic by author

American and European pioneers first started settling Port Angeles and the Elwha watershed in the mid to late 1800s (Crane 39). They too lived off the Elwha watershed's abundant resources. Almost as soon as the settlers began arriving, the power of the Elwha River as a natural resource was became evident. Two men in particular, the entrepreneurs Thomas T. Aldwell and George A. Glines, saw the

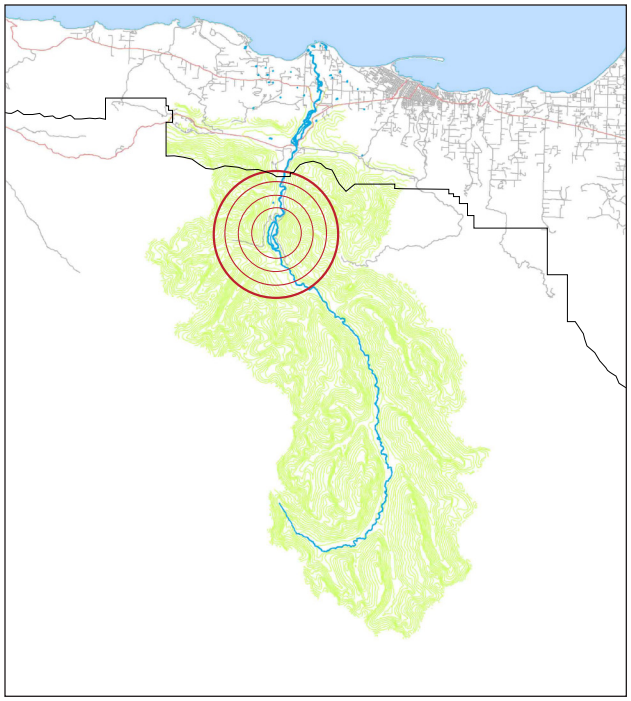

Fig. 22 Elwha River watershed
graphic by author

potential of harnessing the powerful Elwha (Sadin and Vogel; Crane). At the time, hydroelectric power was closely tied to growth and industry, and Port Angeles needed a constant supply of electricity in order to develop economically (Duda 2). Logging and fishing were growing industries and their associated processing plants and mills needed electricity (Crane 50).

After many years spent accumulating land and financial sponsorship, Aldwell and Glines began constructing the first of two dams that would harness the Elwha's power. Aldwell in particular, saw himself as a conqueror, taming the wilderness that was a barrier to progress (Crane 56). In the early 20th century, it was common to think that nature and natural resources could be tamed, managed, manipulated, and improved upon using science and technology, all in the name of human progress (Crane 72). Furthermore, boosters and civic leaders thought the dam would not only bring economic prosperity and growth to Port Angeles and the region, but they also believed hydroelectricity would "improve American society" through jobs, community development, and modern living (47). A local newspaper, the Olympic-Leader, proclaimed, "nothing more helpful and desirable could be installed among us than the great power of the river converted from its waste and loss into a magnificent source of energy and strength" (Sadin and Vogel 59-60).

In 1911, construction began on the first of the two dams, the lower Elwha Dam, and took three years to finish. The Elwha Dam's reservoir was the 2.5 mile long Lake Aldwell. Within 13 years it became apparent that the Elwha Dam alone could not supply enough

power to Port Angeles (101). In 1926, construction began in on the upper Glines Canyon Dam. Figs. 23 and 24. This dam was much taller than the 105 foot Elwha Dam and stood at 210 feet tall. The Glines was completed in 1927 and harnessed the 2.8 mile Lake Mills. Figs. 25 and 26. The Olympic National Park was established in 1938 and within its boundaries was the Glines Canyon Dam and most of the Elwha watershed.

Over the course of a century, the two dams caused drastic change along the river and throughout the watershed. The most widely perceivable damage occurred to at least seven anadromous fish runs that called the river and its tributaries home, blocking their upstream spawning migration and wiping out their annual runs. Fig. 27. With 90% of the watershed blocked by the dams, the nearly 400,000 fish returning to their spawning grounds each year dwindled to just 3,000 fish a year (Crane 3; Sadin and Vogel 221). The salmon's absence affected the entire watershed including the animals, aquatic species, soils, plants, trees, and the entire forest ecology that relied on the salmon for sustenance and nutrients (Crane 14). The Lower Elwha Klallam Tribe also lost their primary food and economic source, as well as their cultural, spiritual, and social traditions that were associated with salmon and river (Sadin and Vogel 1).

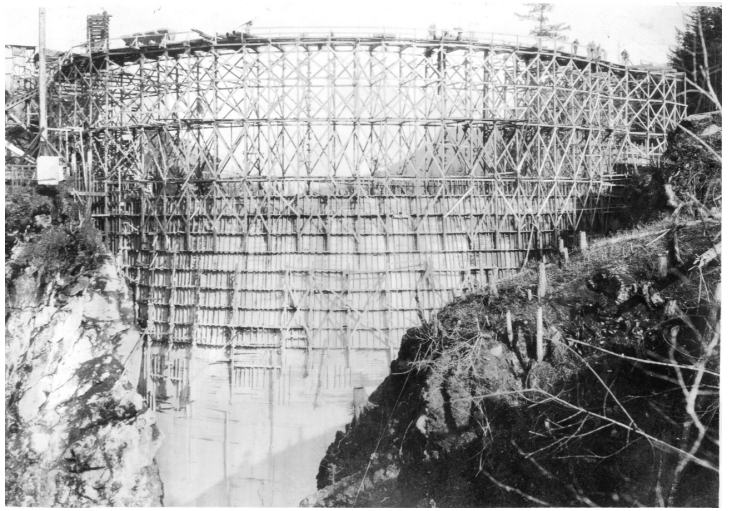

Fig. 23 Glines Canyon Dam during construction photograph courtesy Clallam County Historical Society

Fig. 24 Glines powerhouse under construction photograph by Robert Clawson

Fig. 25 Glines Canyon Dam completed
photograph from Elwha River Restoration - Facebook

Fig. 26 Lakes Mills reservoir
photograph by Tom Banse

In addition to blocking fish passage, the dams prevented the natural flow of sediment downstream resulting in the accumulation of 34 million cubic yards of sediment behind the dams, 6 million in Lake Aldwell and 28 million in Lake Mills, enough sediment to cover a football field 5.5 miles deep in sand, silt, clay, sand, and gravel (National Park Service Dam Removal Blog). Upon reaching the two reservoirs the river slowed, dropping out the sediment that it had carried from miles upstream on its way to the ocean. This sediment piled up year after year forming deltas in each of the lakes; the delta of Lake Mills accumulated as much as 50-90 feet of sediment (Bountry et al. 21). Fig. 28. Massive walls of sediment also collected directly behind the dams with as much as 30-50 feet of sediment behind the Glines Canyon Dam (22). This sediment, trapped in the reservoirs, would normally in a free flowing river provide crucial nutrients and habitat to the river downstream (Crane 92). Thus the sediment, contained behind the dams was not merely extra material but crucial to the health of the river and the entire watershed (92). The sediment prevented from traveling downstream left the riverbed scoured of the sand, gravel, and cobble necessary for salmon spawning so that the few remaining runs in the lower reaches of the river vied for the last remaining spawning sites (National Park Service website – Historic

Anadromous Fish Runs in the Elwha). Nutrients normally carried in sediment could not reach the lower river below the dams. The absence of sediment at the mouth of the river left little to replenish the tidal erosion of the Tribe's shellfish beds or the adjacent beaches and spits (Crane 91).

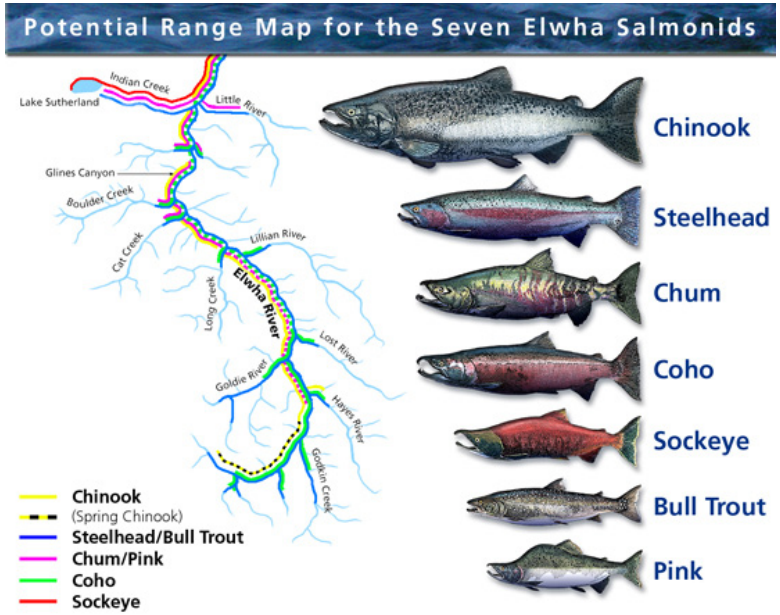

Fig. 27 Seven salmonids of the Elwha River and their ranges image by Olympic National Park

During three decades of debate, it was determined that the Elwha River and its fisheries should be restored. The P.L. 102-495 Elwha River Ecosystem and Fisheries Restoration Act, signed by President George H. W. Bush on October 24, 1992, paved the way for the removal of the Elwha Dam and Glines Canyon Dam (Sadin and Vogel 201). After the signing of the Act it was eventually determined that the only way to restore the Elwha ecosystem and fisheries was to remove the dams. Dam removal began in 2011, and by the summer of 2012 the entire Elwha Dam had been removed without a trace of its structure remaining. The scar on the landscape, covered by erosion control netting, is all that exists of the Elwha Dam. The Glines Canyon Dam, however, is only 2/3 removed. Figs. 29 and 30. The remaining 1/3 is scheduled for removal once the Port Angeles water treatment plant is up and running again; sediment has disabled the plant and it awaits repair.

The dam removal on the Elwha River has magnified ecological changes that often occur so slowly as to go unnoticed to the untrained observer. Now, however, even the casual visitor can witness geologic time, among other processes, in action, particularly in the

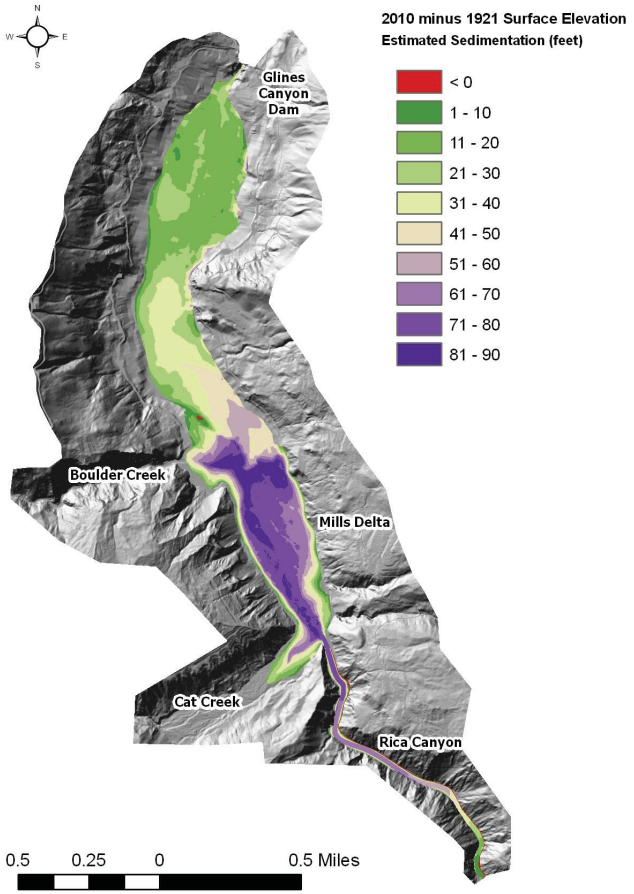

Fig. 28 2010 Lake Mills estimated sediment image in Bountry et al.

sedimentation, erosion, and deposition taking place in and along former Lake Mills. I chose to study this site because of the dramatic ecological changes taking place, and because the Glines Canyon Dam is still in the process of being removed. With the Glines Canyon Dam nearly demolished, the former lake, and the entire watershed, is changing along a spectrum of time from seconds to hundreds of years. For example, the delta is constantly shifting right now with sand, gravel, and cobbles eroding and moving downstream by the second. Reforestation of the lakebed, however, will likely take place over hundreds of years. The continual shifting of sediment through erosion and deposition at former Lake Mills presents an opportunity to employ ephemeral design interventions to further expose and interpret these ecological processes. Furthermore, site specific ephemeral design interventions can help the visitor draw connections between the past, present, and future ecologies of the former Lake Mills, as well as connections between the former Lake Mills and the watershed.

This thesis attempts to capture time through an ephemeral design intervention within the former Lake Mills reservoir. This ephemeral intervention will expose and interpret different scales and passages of time through the addition of a vertical element which will draw attention to the changes occurring on the horizontal plane - the sedimentation, erosion, and deposition of the former lakebed. The intervention involves “reforesting” the former lakebed, beginning in the upper lake, delta area, and gradually “growing” north, or down river. The “forest”

composed of logs previous submerged by the lake will “grow” along a grid, successionally, and the process of moving and planting the logs will occur simultaneously.

Fig. 29 Glines Canyon Dam mostly removed
photograph by Greg Gilbert March 16, 2013

Fig. 30 Lake Mills dry lakebed
photograph by John Gussman

SEDIMENTATION OF LAKE MILLS

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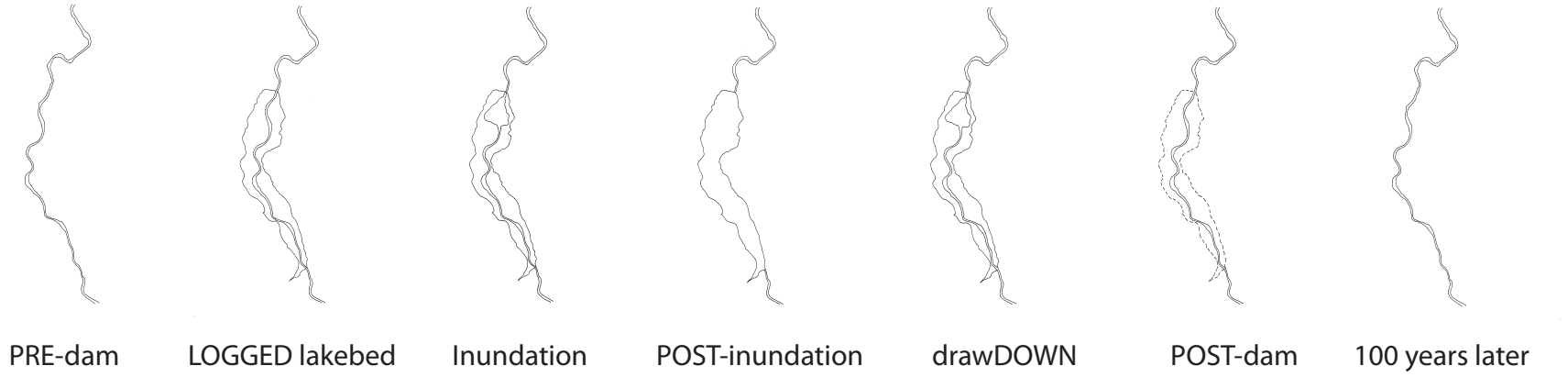


Fig. 31 ELWHA RIVER MORPHOLOGY

This graphic depicts the many shapes of the Elwha River and changes to the river's morphology in response to the various stages of dam construction and dam removal.

graphic by author

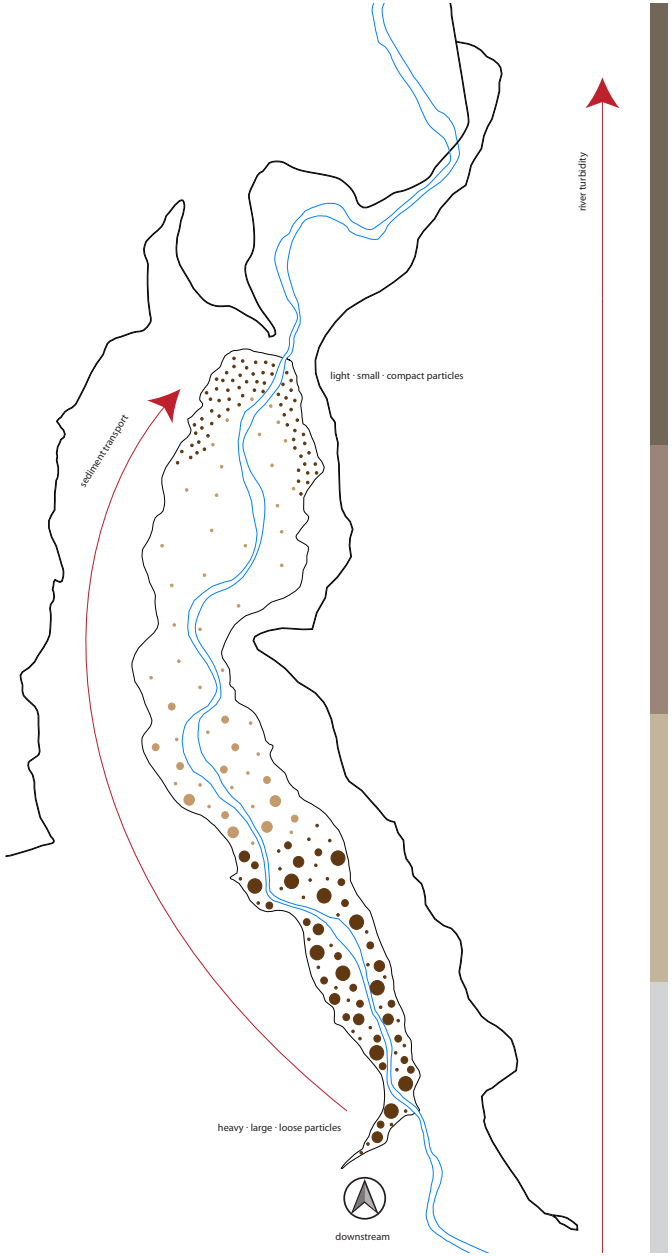
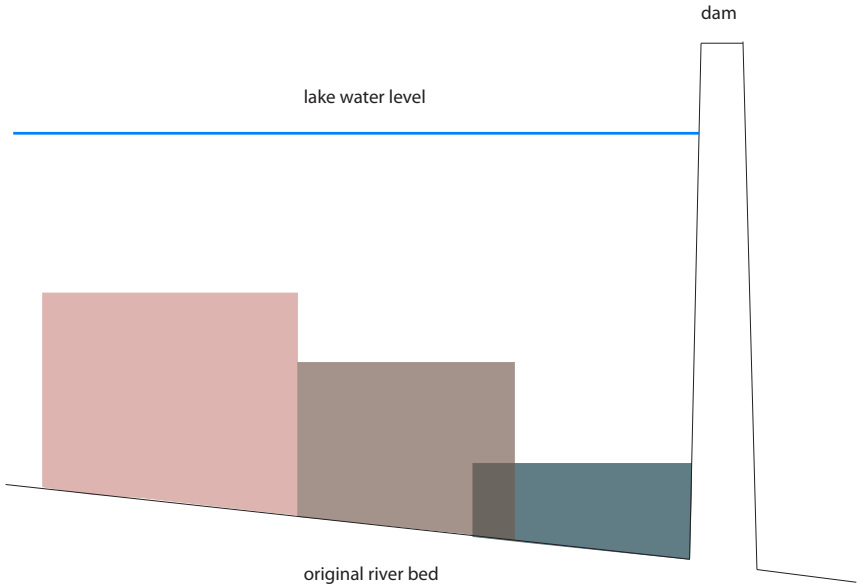
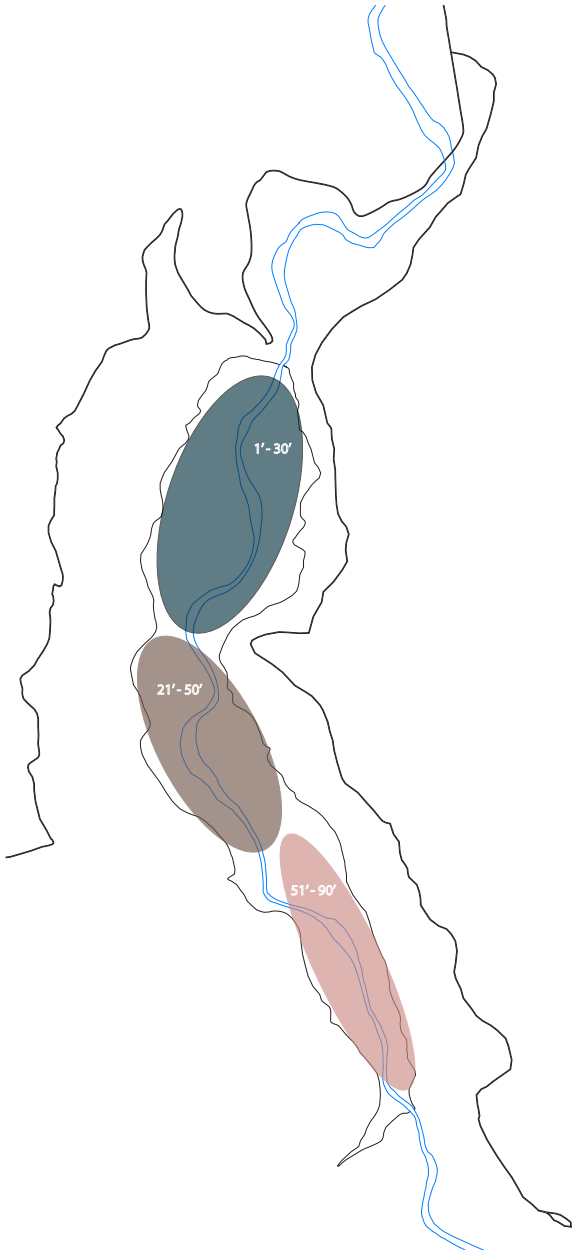


Fig. 32 EROSION AND DEPOSITION ALONG LAKE MILLS

Most of the accumulated sediment lies in the upper lakebed. Since the lake was drawn down, however, the sediment is on the move, continually making its way downstream.

graphic by author





Figs. 33 and 34 SEDIMENTATION OF LAKE MILLS OVER 86 YEARS

The upper lakebed is buried in 51-90 feet of sediment while the lower lakebed has up to 30 feet of sediment.

graphic by author

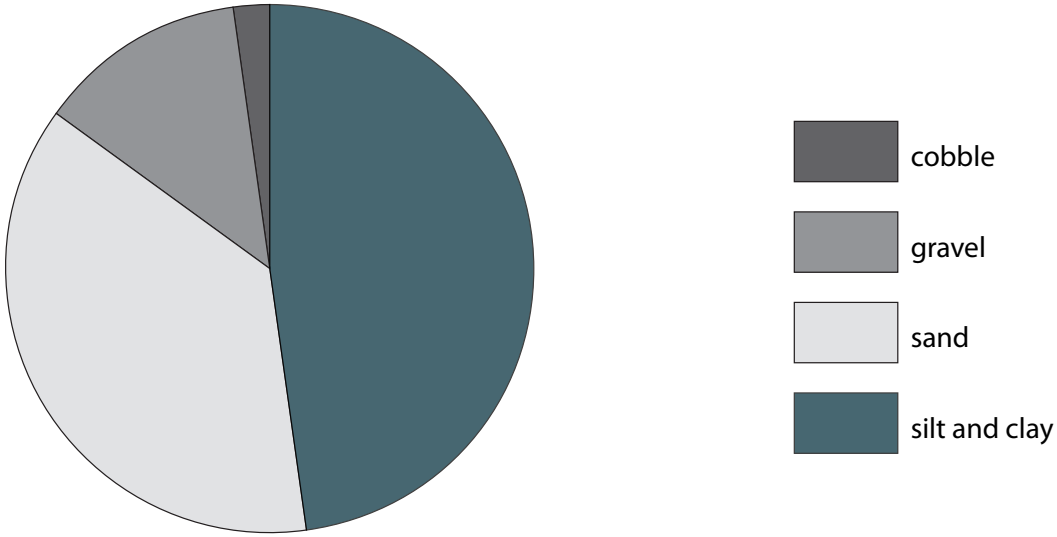


Fig. 35 LAKE MILLS SEDIMENT COMPOSITION

Sediment in Lake Mills is composed of cobble, gravel, sand, silt, and clay. Silt and clay make up nearly half the composition.

graphic by author

Fig. 36 LAKE MILLS SEDIMENT FIRST HAND

photograph by author

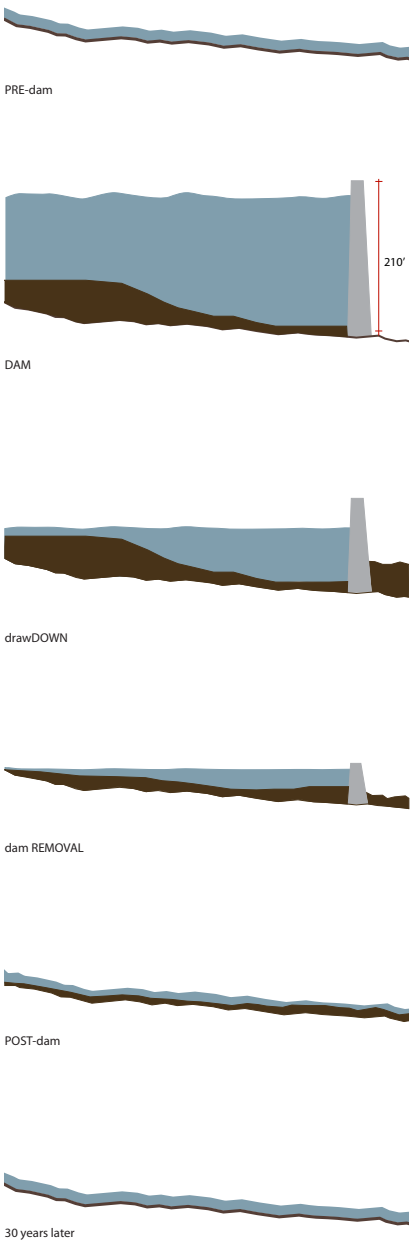


Fig. 37 CHANNEL CONDITIONS

During drawdown the sediment that had accumulated in the upper lakebed began moving downstream. The sediment will continue to move downstream until the channel reaches similar pre-dam conditions.

graphic by author

DESIGN INTENT + GUIDING PRINCIPLES

Time is but the stream I go a-fishing in (Thoreau 64).

The ephemerality being captured in this thesis goes beyond the reoccurring and predictable changes over time that we are accustomed to in our daily lives. I am interested in an ephemerality that is captured in the design and the design process. In contrast to Prospect Park, mentioned earlier, I want to highlight the value and inherent ephemerality in the design process itself. Rather than simply focusing on the final design solution, I am also interested in the ephemerality of the process behind the design, what it takes to solve the design problem. This process and its own ephemerality will be evident in the mechanisms that enable my design solution.

In preparing to design I developed a conceptual framework comprised of six design parameters that formed the intent behind my design. With each decision I refered to these parameters to be sure I was adhering to my own rules. Having a set of parameters not only helped in the decision making process, but it also limited my options so that I had fewer ideas to choose from; several parameters in particular limited, in a positive way, the direction this project could take. Moreover, the parameters provided boundaries for my project and kept it manageable. The parameters established include:

the intervention should be ephemeral

the intervention should be composed of materials from the site that are able to decay in situ

the intervention should be simple, yet elegant

the intervention should expose and interpret an ecological process

the intervention should provide an ecological benefit while not causing any lasting ecological harm

the intervention should be experiential and didactic

In describing the intent of an art installation devoted to mourning and loss, Mary O'Neill describes her use of the term ephemeral. When discussing ephemeral art, the word is often used to describe temporary work that exists for a specific period of time and is then dismantled, abandoned, or removed (88-91). O'Neill contends that her use of the word is used to "distinguish works in which the decay or disappearance of the work over the course of time is an intrinsic element of the piece. In these cases the decay and/or disappearance is intentional and is an essential aspect of what the work communicates, not the result of accident or carelessness" (88-91). This is precisely the definition of ephemerality that sums up my design intent in this thesis. And not only is there a focus on ephemerality, but also on the deliberate decisions that adhere to ephemerality as a guiding design principle.

Ephemerality as a Guiding Design Principle

Ephemerality for the purposes of this thesis is defined as fleeting and became the guiding principle of my design, against which I weighed all my design decisions. Knowing that ephemerality engages different physical scales and scales of time, just as the ecological changes occurring at Lake Mills also exist at different physical scales and scales of time, it was important to acknowledge and represent ephemerality in this way. I set out to deliberately use time as a design medium through which to expose and interpret ecological change occurring at Lake Mills. Next I will describe how ephemerality served as a guiding design principle during each phase of the design process.

Site Selection

To explore ephemerality it was important to study a site that was undergoing perceptible ecological change. Since change is the principle quality of ephemerality it only made sense that the site I study be recognizably changing and provide an opportunity to engage with that change. When I discovered Lake Mills in the summer of 2012, the Glines Canyon Dam, at the lake's north end, was still in the process of being removed, unlike the lower Elwha Dam which was completely removed without a trace of its existence except for the soil erosion netting covering the former dam site. Due to the unforeseen failure of the new Port Angeles water treatment plant, a mitigation requirement for dam removal that stopped functioning after being clogged with sediment, removal of the Glines Canyon Dam is on hold with a new anticipated completion date of September 2014. I was drawn to the dynamic nature of the site, and the variety of ecological phenomena taking place there. The fact that the dam remained in place throughout my project ensured that the site was undergoing active change with no hint of resolution in the foreseeable future.

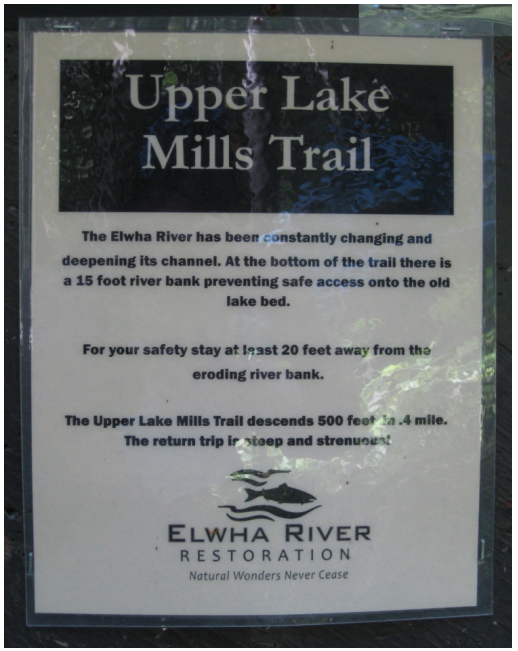


Fig. 38 Upper Lake Mills Trailhead sign-post warning August 3, 2012 photograph by author

Choice of Ecological Phenomena: Sedimentation

I had the opportunity to visit Lake Mills twice, once on August 3, 2012 and a second time on April 26, 2013. Since the Glines Canyon Dam is still actively being removed access to areas near the dam is prohibited, but the public can access the lakebed via the Upper Lake Mills Trail at the southern end of the lake. Fig. 38. This trail puts the visitor in the delta area of the lakebed where most of the sediment settled as it dropped out of the river which lost velocity upon reaching the lake. Here, over the years, the delta accumulated 51 to 90 feet of sediment, composed of heavy, large, loose particles, a mixture of sand, silt, gravel,

Fig. 39 Lake Mills - August 3, 2012 mostly flat photograph by author

Fig. 40 Lake Mills April 26, 2013 many sediment terraces photograph by author

and cobble.

For 86 years the dam prevented the natural flow of sediment from the upper watershed near Mount Olympus to the Strait of Juan de Fuca which resulted in an unprecedented accumulation of sediment in Lake Mills. By visiting the site twice over the course of eight months I was able to observe and record the sediment changes that occurred in the delta during my absence. During my second site visit it was evident that the sediment in the delta had moved drastically since my last visit. For example, on my first visit the lakebed was mostly flat, extending between the steep banks that defined where the shoreline once existed. Fig. 39. On my second visit, however, the lakebed was composed of a series of terraces, of a variety of heights, many steep enough that I did not venture down them and which prevented me from getting close to the river along the far western edge. Fig. 40. These terraces were remarkable not only for their steepness, but also because they were eroding as I stood there. At one point I heard a strange noise and eventually turned to see that what I heard was sand, gravel, and cobble eroding from one of the terraces. This was ephemerality in action. Right before me I was witnessing change within a matter of seconds as well as change that had occurred over the period of eight months. It was then that I chose to focus on the sediment that for me typified ephemerality; it was moving and changing the river system within a matter of seconds to years and at scales from the micro to the macro.

The sedimentation of Lake Mills has shaped the form and flow of the Elwha River and now serves as a dominate factor in every step of the dam removal process, in anticipated as well as unanticipated ways. It is the sediment that dictated how slowly the water was drawdown from the lake, ensuring that it moved slowly enough downstream so as to not damage or kill everything in its wake (National Park Service, Dam Removal Overview). It is the sediment that increased turbidity in the river as the water moved downstream culminating in a giant plume at the mouth of the river. Figs. 41, 42, and 43. It is the sediment that clogged the gills and killed recently released hatchery salmon (Schwartz). It is the sediment that has clogged the Port Angeles water treatment facility temporarily halting the dam removal (Gottlieb).

In the accumulation and dissemination of sediment I found an ecological process that embodied ephemerality, one that could be interpreted and exposed in a way that would prompt the visitor to question the environment and landscape surrounding them. To ask how and why all this sediment accumulated here. To ask where the sediment is going, how it will get there, and how long it will take. To ask what happens downstream as the sediment is swept away by the river. Furthermore, I wanted the visitor to wonder what was happening at Lake Mills, to imagine what

Fig. 41 Clear water as the Elwha enters Lake Mills August 3, 2012 - photograph by author

Fig. 42 Turbid water of the Elwha below the Glines Canyon Dam April 26, 2013 - photograph by author

Fig. 43 Sediment plume at mouth of the Elwha River photograph by Tom Roorda

Fig. 44 Lake Mills logged for inundation photograph courtesy Clallam County Historical Society

Lake Mills's future might be, to be surprised by what they witness, and to be curious enough to seek answers.

Material Selection

In an effort to expose and interpret the sediment's shifting and eventual movement downstream I decided to counter the sediment's horizontal nature, as it spread across the landscape in layers, with a vertical element that would mark the sediment's movement. Returning to the principle of ephemerality and the goal to create an ephemeral design, I chose to use materials from the site that could be left in place and decay on site without doing any known harm to the ecosystem, although this design will also have unanticipated consequences. I wanted this material to have a distinct transience.

The identification of materials began with the most predominate and visible element within the lakebed, other than the sediment: the logs. Much of the Lake Mills watershed burned around the turn of the century leaving some surviving old growth trees, which according to the Northwest Forest Plan were likely at least 250 years old (email to author from Joshua Chenoweth, Olympic National Park, July 18, 2013). The trees

that survived the forest fire, or were established after the fire in the late 1800s to early 1900s, were logged in preparation for the dam construction. Fig. 44. Only riparian trees were left in place to be inundated and submerged by the river. Over the years logs that were flowing downstream were blocked by the dam and remained in the lake around its shoreline. Fig. 45. After the drawdown of the lake in preparation for dam removal, these submerged and floating logs were visibly collected all along the shoreline. Fig. 46. Seeing an abundance of material on site that could remain on site and decay on site, I chose to work with the logs that had accumulated along the shoreline of lower Lake Mills. These logs embody the cycle of growth, death, and decay that are inherent in the principle of ephemerality.

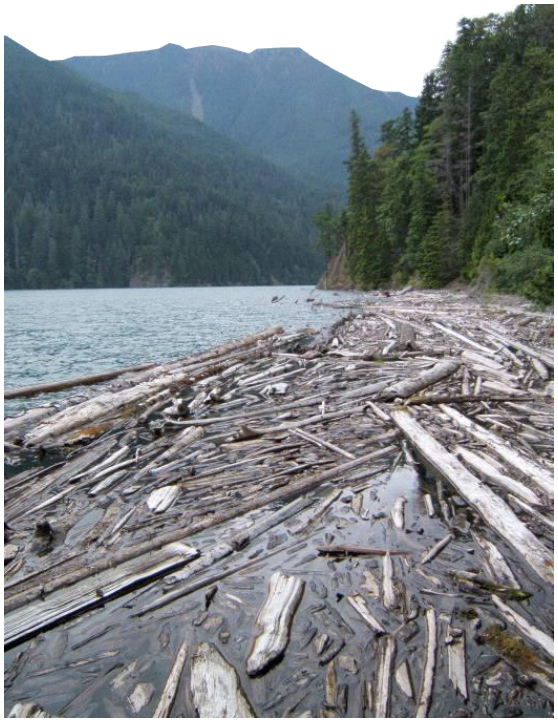


Fig. 45 Logs floating in Lake Mills photograph in Chenoweth 2011

Seven tree species were predominate within and near Lake Mills: Douglas-fir (Pseudotsuga menziesii), Western Red Cedar (Thuja plicata), Western Hemlock (Tsuga heterophylla), Grand Fir (Abies grandis), Red Alder (Alnus rubra), Bigleaf Maple (Acer macrophyllum), and Black Cottonwood (Populus trichocarpa) (Chenoweth 2011, 22-24). Some ratio of these seven species account for some of the logs that have accumulated along the shoreline. Since these species are a mixture of conifer and deciduous, softwood and hardwood, slow growing and fast growing, and with very long lifespans to moderate lifespans I expect to see a similar range in their decay. For example, the Western Red Cedar and the Grand Fir should rot slower than the deciduous trees. But this is not always true as the Black Cottonwood and the Bigleaf Maple can remain intact for many years.

Fig. 46 Logs lining the lake's shoreline
photograph from Elwha River Restoration - Facebook

With this knowledge I returned to my principle of ephemerality. While ephemeral means fleeting, which may not seem applicable in the case of logs slowly decaying over a long period of time, some species will decay at a rate that is relatively short compared to other species. Through their decay over time visitors can engage not only the installation of the design but also its ruination.

"Reforesting" the Lakebed

The design proposal made here does not, in fact, reforest the lakebed in terms of replanting or renewing the forest that once existed on the site, but rather suggests an analogy for the ancient forest of the past and the new forest of the future. It is a proposal to create a new mark on the land using the remains of the old growth forest of the past–the logs and detritus of the logging and dam building processes. It is a conceptual "reforesting" without actually initiating a reforesting or planting process. In this sense, "reforesting" is a term I use to both challenge the renewal and restoration of the larger region and one that frames how I approach the site and its materials, as well as their placement and evolution within the landscape.

The idea of "reforesting" Lake Mills fulfills three purposes, two related to ephemerality and one born of necessity. First and foremost, the vertical logs will expose and draw attention to the ephemerality of the sediment as it shifts and moves underneath them. The logs, buried ¼ of their length in the sediment, will over time, lean, dislodge, and fall over. When and where the sediment moves will be reflected in the shape the "forest" takes. The continual movement of the sediment will be evident as the "forest" morphs with it. Since

the “forest” will be erected sequentially, in rows from south to north, the first rows erected may fall as the next rows are planted and before the final rows are even installed. In keeping with the idea of ephemerality, the “reforesting” plan attempts to capture the most sediment movement over time.

Secondly, this new “forest,” composed of erected logs, directly recalls the ancient forest that inhabited this location prior to the dam construction, and the future forest that will eventually, over many, many years, re-inhabit the drained lakebed. Forests that are not subjected to human interference, and that withstand fire, wind, drought, infestation, or other natural occurrences, can seem to exist outside the human time frame. Forests such as these grow and decay at a rate that far exceeds the typical human lifespan. As a result of this, many forests we visit seem timeless as they grow and decay without human witnesses. Recalling the past and future forests of this site draws attention to the fleetingness of a thing that seems timeless. This new “forest” also reminds us that an entire living forest, that took years far longer than the human lifespan to grow, can be removed in a single act during a single day, week, or month. That same forest, however, cannot be as easily or quickly re-erected; some acts, such as dam construction, cannot be easily, quickly, or ever undone or erased.

Thirdly, while this design proposal does not reforest the lakebed in the traditional sense of renewing or restoring a forest– it is an analogy for the forest–it nonetheless serves an ecological function. As the river channel moves and changes course over time, I predict it will move through the new “forest” capturing some logs in its channel. These logs will be carried downstream where some will get hung up on the river banks and serve as large woody debris (LWD). The lower river, below the two dams, has been deprived of much needed LWD for over 100 years. LWD plays an important ecological role in the river system, providing crucial habitat for both salmon and the surrounding forest. “Reforesting” the lakebed creates an opportunity for some of the logs to re-enter the river system.

Fig. 47 Men working high above the Glines Canyon Dam
photograph by Robert Clawson

The logs that are not captured by the river, and instead remain in place, can serve as nurse logs to help re-vegetate the lakebed. These logs will capture seeds that fly into the lakebed from the surrounding forest, providing a place to take root that is safe from predators and the elements. These nurse logs can increase the chances that these seeds will take root and survive.

Repurposing the Formerly Submerged Logs

The logs for "reforesting" the lakebed are moved from the lower lakebed to the upper lakebed for three reasons. The first is that in order for the "forest" to reflect the sediment movement the "reforesting" needs to begin in the upper lakebed where the continuously moving sediment is located. As the sediment shifts and moves downstream, the logs will also move and some will be swept downstream as the channel intercepts them. Secondly, now that the lakebed has been drained, the logs are stranded along the shoreline of the lower lakebed, some as far as 154 feet above the river. Without a massive flood event or landslide, these logs will never enter the river system again. They will decay in place but never serve as the LWD much needed downstream of the dams. There is an abundance of these stranded logs in the lower lakebed, so in an effort to improve the ecology of the lower river, some of these logs will be moved upstream to "reforest" the lakebed. The third reason for moving the logs is in relation to ephemerality and references the cyclical nature of life. Time is continual and within it all life undergoes a cycle of birth, growth, death, and decay. The logs themselves participate in this cycle both metaphorically and physically as they begin a new "life" as LWD or nurse log and then decay over time.

Human Powered Movement and Installation

Ephemerality is a part of being human. In fact, who has not uttered the phrase, “life is short.” Calling to mind the fleeting nature of our human existence, I chose to “reforest” the lakebed using human labor. This human labor contrasts the lifespan of the Elwha River and surrounding forest that can exist for thousands of years or more, especially without human interference. In contrast to the lifespan of our environment, our lives short and fleeting. “Reforesting” the lakebed using human labor also parallels the building of the dams. In 1926, when construction began on the Glines Canyon Dam, machinery certainly existed. Historic photos, however, primarily show wooden scaffolding and men working by hand from precarious heights. Fig.47. Many many laborers were employed to build the dams, and the work was hard and physical, not to mention dangerous. Although the work I propose is not dangerous per se, it is physical and involves lifting and moving logs, digging holes, and operating the mechanisms. I propose the use of human labor as a means to connect with the history of the site and to capture the effort involved in the making of the dams and now the undoing of them.

Relocating and installing the logs in the lakebed using human labor is a physical process and, as a result, it takes time. Since scales of time are a central component of this thesis, time is engaged in the process as well as the final design. The relatively slow and deliberate human effort involved in reforesting the lakebed lies in contrast to how quickly the Glines Canyon Dam was built. “Reforesting” using human labor, contrasts early 20th century notions about mechanization, and the progress that industry afforded; progress that came at great costs. Human labor in this project is slow and deliberate in contrast to industrialization’s speed and carelessness.

Now that the dams have been removed, restoration of the area will be a decades, if not centuries, long process. This restoration

attempts to restore some of the area's previously exisiting natural systems and habitats, an approach that is distinct from this proposal's use of the idea of "reforesting." Multiple scales of time exist across the site: a massive 210 foot concrete dam was erected in one year; it existed for 86 years; it took three years to remove; restoration will take hundreds of years. In keeping with these varied scales of time, this design proposal incorporates slow and deliberate human labor, which will take seven years to construct and an unknown amount of time to disappear.

Simple Mechanisms Assist the Human Effort

In order to ensure that the human effort of "reforesting" the lakebed is slow and deliberate, the proposed design identifies mechanisms to assist the physical labor involved. There is beauty in the hand-made, recalling a time before mass production. The simple mechanisms are intended to be built by the very laborers who will use them, and they can be constructed and removed with little impact upon the landscape. They primarily consist of pulleys that allow heavy objects to be moved with relative ease. The mechanisms themselves are fleeting; they only exist for this project and are removed from the landscape when no longer needed.

Length of Time to Reforest the Lake

The installation of the proposed design is intended to engage the community and visitors for the course of seven summers. The number seven refers to the seven anadromous fish species, mentioned earlier, that used to call the river home and will hopefully, over time, return to the river, as well as the seven primary tree species, also mentioned earlier, found near Lake Mills prior to the damming. Seven years allows for a slow and deliberate process of "reforesting" while also being fast enough to allow the visitor to witness the forest changing shape. The summer months will be a time of high activity as the installation takes place and humans mark the landscape. The winter months will be less active when the river, rather than people, makes its mark upon the "forest." I suspect that

the "forest" will morph considerably during this seven years. Rows will be installed as previous rows fall down or wash away, and it is foreseeable that the "forest" will fall down as fast as it is put up. In this sense, I am relinquishing my control as the designer, allowing nature to take over once again. And in this unpredictable state, the ephemerality of the design is exposed.

Marking the Landscape

> *On the surface, America is a carefully measured landscape of survey lines, rectangular fields, irrigated circles, highways, railroads, dams, levees, canals, revetments, pipelines, power plants, ports, military zones, and other such constructions. All are efficiently laid out with ingenious indifference to the land, crossing desert, forest, plain, marsh, and mountain with a cool, detached, and rational logic. These highly planned constructions are literally measures that have been taken across the American landscape in order to ensure a productive human occupation of the earth and its resources. Many of these measures possess dimensions precise yet fantastic, and they have constructed what is perhaps the closest approximation of utopia yet achieved by humankind.*
> (Corner and McLean 25)

The Glines Canyon Dam has left its mark and imprint upon the landscape. This mark, in the name of human progress, changed the landscape in ways that may never be erased and never should be. Drawing inspiration from the marking of the dam I set out to mark the landscape in a smaller, lighter, less destructive way; I sought to mark time and change through "reforesting" the lakebed while using other marks to interpret the history of the site, particularly the human labor involved in building the dam and the process of "reforesting" the lakebed.

While searching for a site to study I began looking at the text *Taking Measures Across the American Landscape*. In this work designer

James Corner and photographer Alex S. McLean, after flying many times across the United States, analyze and theorize on the American landscape through aerial photographs, collage, and text. I was particularly interested in their discussion on the ways in which the American landscape has been measured and divided. The discussion begins with traditional measuring methods that were based on the human body and its relationship to physical activity and materials (Corner and McLean 27). For example, a farmer in medieval Ukraine would measure a field based on how much land could be physically sowed or harvested in one day (27). This measurement was "day of field" (27). In early France, a farmer would measure a field based on the area of land that could be plowed by two oxen in one day (27). This measurement was an arpent (27). And on the west coast of Ireland, a field was measured by the distance a farmer could carry stones removed from the topsoil (27). These measuring devices were relative to the farmer performing the work and the size and shape of the land they were working. Other means to measure rely solely on the human body rather than labor. For example, distance can be measured as "a stone's throw away" or within "shouting distance" (27). Similarly, quick measurements can be obtained pacing. Each of these methods relies on the human body as a device with which to measure distance within the landscape.

The modern method of measurement that followed the agrarian methods was based on standardized units, such as acre and hectare, rather than the more qualitative attributes of either the measurer's body or the land being measured. Corner argues that the traditional methods of measuring land, which were not only based on the human body, labor, and the specific land to be measured, but also cosmology, emphasized the connections between people, place, and activity; practical life was imbued with symbolic meaning (27). Modern measurements, however, disregard natural elements in an effort to maintain prescriptive, rational units, such as when parcels bisect natural features like rivers and mountains. This grid, based on the Public Land Survey System discussed later, is an artifice placed upon the landscape that has no apparent relationship to the elements that make up the landscape as it is experienced today.

This thesis draws inspiration from early and modern survey methods. The "reforesting" grid refers to the artifice of modern land divisions that adhere to uniform standards while disregarding natural elements of the landscape. The grid is the human construct that opposes and ignores the seeming randomness of nature. The human labor involved in "reforesting" the lakebed also refers to the use of the human body for measuring land. While Lake Mills is too large to be experientially measured by the human body, the physical activities involved in "reforesting" the lakebed are performed by human labor. Since each act of "reforesting"—skidding, lifting, dragging, lowering, and installing—is performed by humans, all design decisions regarding each activity bore the human body in mind. How far can a person and a horse drag a log, how many people are needed to lift a log, what size log is manageable for people moving and lifting it, what devices are necessary to aid this human labor? And finally there is the question of measuring, what units are used and how are the marks made.

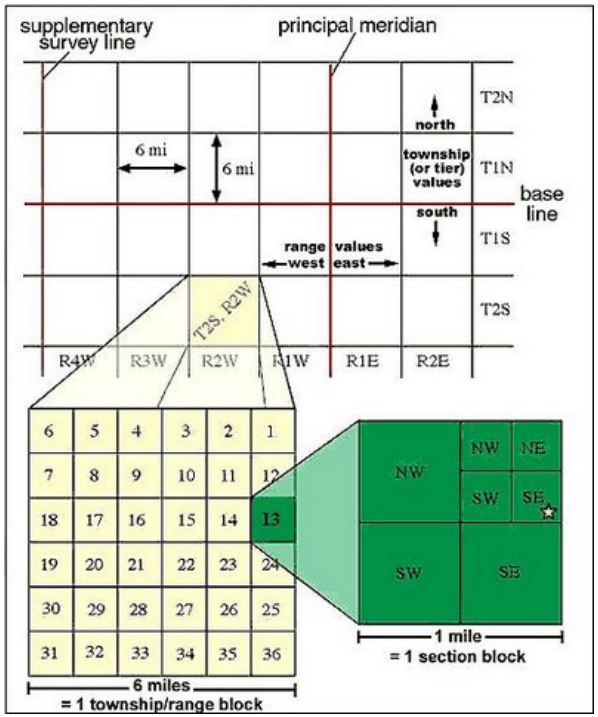


Fig. 48 Public Land Survey System grid image by www.geology.isu.edu

Measuring, Mapping, and Marking the Land

Human occupancy, labor, and progress have been continually marked across the American landscape. These marks upon the land reveal, in part, the human desire to possess, control, occupy, and manipulate the land and its resources in the name of progress. In the desire to possess the land, American and European settlers of the West were eager to measure, map, and mark the land they intended to

occupy, control, and manipulate. These measurements, mappings, and markings ensured settlers' ownership and land rights, and which when firmly established allowed them to occupy, work, and possess a portion of the American West. These marks of human progress were both physical and conceptual. Surveyors set out to impart boundaries upon the land in order to divvy it up amongst those seeking to possess and occupy it. The Land Ordinance of 1785 initiated the Public Land Survey System which was proposed by Thomas Jefferson. This survey system was employed to divide the American landscape into 24x24 mile quadrangles with each quadrangle comprised of 16 6x6 mile townships with each township comprised of 36 1x1 mile sections which were then further divided into lots and aliquot parts (National Atlas.gov) Fig. 48. Thus, the grid is used to exemplify human inscriptions on the land as well as how we as a culture have come to read the landscape, whether wilderness or urban, country or city.

The Grid

The "reforesting" takes place along a grid, a clearly human and cultural mark on the land. The grid is a human made artifice in contrast to the seeming naturalness of the forest. It is a methodical control placed upon the landscape, and it symbolizes the calculated, rational thinking that, it was thought during industrialization, would advance human progress. It reflects the same rational thinking that led to the construction of the dams. The grid thus serves to reflect the confidence that American culture has placed in rational thought and the engineer's reading of the site and its natural resources.

The grid was also a critical element in the settlement of the west and imposed order upon a seemingly random landscape. It is emblematic of the west and the conquering of the wilderness, whether by railroads, townships, or dams. Initiated by Thomas Jefferson, the grid is the primary survey method used to measure and map the United States (National Atlas.gov). This survey method, the Public Land Survey System described earlier, divides land into approximate rectangles and as these rectangles abut one

another a grid pattern forms. The grid's predecessor was the British metes and bounds survey method which used natural or artificial monuments, such as streams, fences, ditches, or roads to establish boundaries (Merriam-Webster Dictionary). In contrast to metes and bounds, the regularity of the grid ignores the topography and landscape elements upon which it lies. Although the dams constructed along the Elwha River were sited in precise locations to take full advantage of the river's energy for hydropower, they simultaneously ignored the topography and landscape upon which they were constructed. The use of the grid to "reforest" the lakebed reminds the visitor of the Glines Canyon Dam and it indifference to the landscape.

The results of the grid survey method are obvious as one flies over the United States and looks down on the quilt-like patchwork inscribed upon the landscape. This inscription is an artifice and evidence of the human desire to own, occupy, inhabit, and control the land. The survey method runs along a north/south and east/west orientation, resulting in the quadrangle, township, and section described above. Directly relating to the township, the forest grid begins with three rows 6x6 feet. The grid then expands as it advances north, just as the sediment breaks up and expands north or downstream. After three rows of 6x6 feet, the grid then expands seven times advancing to three rows of each: 12x12 feet, 24x24 feet, 48x48 feet, 96x96 feet, 192x192 feet, and 384x384 feet. As the visitor walks north through the forest they see and feel the grid expand, and as they walk south they see and feel the grid contract in around them. They become engaged in the discourse between the rationality of the grid, the measurement of the body against the landscape, and the forces of nature and natural systems.

Dragging the Logs

Dragging the logs from the lower lakebed to the upper lakebed is a slow, deliberate process that will leave a mark on the gravel road that parallels the lakebed. This mark highlights the process of moving the logs including the time and effort it took to move them and

the human and animal labor involved. Just as the dam construction in 1927, completed by human and animal labor, left a mark upon the landscape, so too does the present day labor and effort of "reforesting" the lakebed become inscribed upon the landscape. Similarly as visitors engage the site, they too will leave marks upon the landscape, footprints and paths, imprints of their visit.

Carving the Logs

Once the logs reach the former boat launch they will be carved, a form of marking, at the balance point from which the logging tongs grasped and dragged them out of the lakebed. This carving imprints the logs with a mark that is clearly identifiable as human, just as the dam and subsequent lake were large, bold human marks on the surrounding landscape. The carving is based on the idea of girdling which involves cutting off a 4 inch strip of bark around a tree in order to kill it. In this situation, however, the girdling is the inverse, signifying the new life that these logs will have as they are moved to the upper lakebed where they will form part of the "forest" and potentially serve as LWD or a nurse log. The carving also marks the journey that the logs take as they are moved from the lower lakebed to the upper lakebed. And long after the "forest" has dissolved into the surrounding landscape, marked logs will be found downstream, remnants of the constructed "forest." Thus the proposed design acknowledges that there are additional histories, narratives, and markings that previous people have erased from the landscape. This design proposes to re-create such marks through the analogy of the carved logs.

The Skyline Poles

Of all the mechanisms for "reforesting" the lakebed, only the poles that hold the cables of the skyline will remain, relatively, permanently in place. These poles are left in place because the base, where they meet the earth, marks the lakebed's shoreline elevation. From this point the visitor can look East or West towards the lakebed and recall where the lake's water level once existed.

These poles, composed of treated wood, will over time decay into the site, but their treated wood will likely decay slower than the logs removed from the lakebed. Due to this greater longevity, the poles will remain a marker of the water level and shoreline long after the "forest" has disappeared. In fact, there may be a time when the lakebed is full of vegetation leaving the poles the only marker that the lakebed existed. And eventually, the poles, and perhaps even the lakebed itself will be gone, consumed by the forest that takes over them. Thus, these poles through their longer lifespan, emphasize the dynamic nature of even that which seems relatively permanent.

EPHEMERAL DESIGN: REFORESTING LAKE MILLS

Sensitivity to time is one of the most important qualities of a landscape architect (Geuze 238).

Sequence of Events

In constrast to how quickly the Glines Canyon Dam was constructed and demolished, the sequence of events choreographed to "reforest" the lakebed takes place slowly over the course of seven summers, using human labor and simple mechanisms. The mechanisms draw from traditional logging practices, since logging is an industry deeply embedded in the history of the Pacific Northwest and particularly the Olympic Peninsula. All of the mechanisms proposed are intended to be hand built and operated; they are simple, and relatively easy to construct, install, and remove. All mechanisms are removed from the site once no longer in use, except for the poles of the skyline. In this way, even the mechanisms' existence within the lakebed is fleeting. Once all work is completed, only traces of the mechanisms and their operation and use will still be evident in the lakebed. Over time, these marks will fade and disappear contributing to the ephemerality of the "reforesting" process.

Collecting the Logs

The logs will be selected according to their height and girth. In order to ensure that the movement and installation of the logs is manageable by simple mechanics and human labor, the selected logs will have a girth of 8-20 inches and a height of 15-30 feet. The 15-30 foot height limit also ensures that ¼ of the height of the log can be buried in the sediment while still leaving a considerable

length of log above ground. These logs will be collected from the lower lakebed first using a skidder pulled by a horse to move the logs to an a-frame gantry. A skidder is typically used in logging practices to move single logs to a desired location. An adapted a-frame gantry will lift the logs out of the lakebed to the former boat launch near the northwest shore. An a-frame gantry is a crane typically used to vertically lift heavy objects. The a-frame gantry I propose has been adapted with a pulley system to be able to lift the logs at an angle.

Carving the Logs

Once the logs reach the former boat launch they will be carved at the balance point from which the logging tongs on the a-frame gantry grasped and dragged them out of the lakebed.

Dragging the Logs along Whiskey Bend Road

After being carved, the logs are dragged by a high-wheel loader from the former boat launch to the upper lakebed along Whiskey Bend Road, a gravel road that parallels the lakebed. The high-wheel loader is a mechanism used to move cut trees. It is used in logging operations, including those occurring around the time of the dam construction in 1927. The high-wheel loader is pulled by a horse as its two large wagon wheels, connected by an axel, hold up one end of the log allowing the other end to drag, or skid, along the ground.

Installing the Logs

Once the logs reach the upper lakebed they are lowered from Whiskey Bend Road by an a-frame gantry to the shoreline where logging tongs attached to a carriage move the logs, one by one, along a cable to an insertion point. The cable is part of the skyline mechanism. Skyline logging is a method of logging by which cables vertically move cut logs long distances through the forest. The cables are

strung across the lakebed and removed as each row is installed. Only the poles used to string the cables across the river are left in place to decay on site; the remaining parts of the skyline mechanism are removed.

Logs Shifting with the Sediment

Row by row the logs are "planted" in the lakebed's sediment along a grid pattern. As the sediment shifts and moves downstream the logs will also shift, lean, and fall. Whatever happens on the horizontal, sediment, plane will be reflected along the vertical, log, plane. As sediment terraces break apart entire rows of logs will fall. As the river channel changes course it will also disrupt the log "forest," weaving in and out of the grid, sweeping some logs downstream and toppling others that will remain in place. As these changes occur, water and sediment will leave marks upon the logs in another reminder of the changes taking place and the forces of nature.

"Reforesting" Process

The following graphics tell the story of the "reforesting" of Lakes Mills:

- concept
- mechanisms
- installation
- envisioning the future

CONCEPT

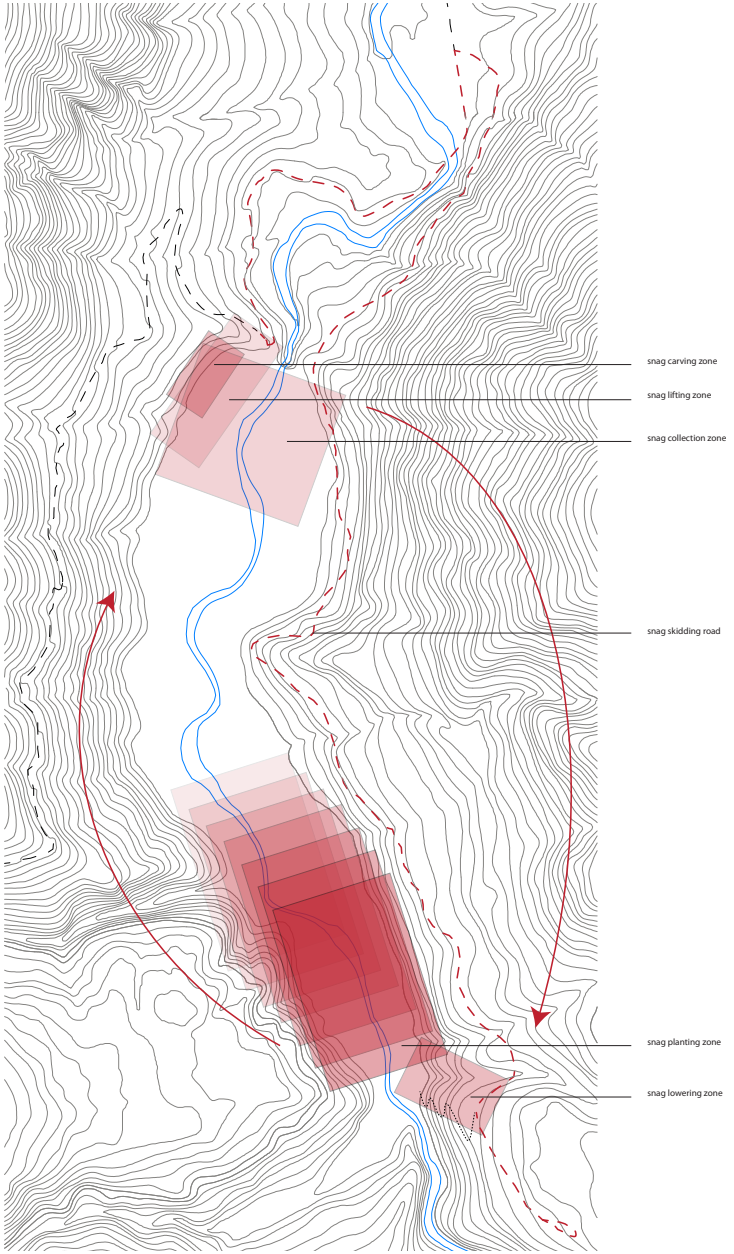


Fig. 49 REFORESTING CONCEPT

Logs are collected near the dam, lifted out of the lakebed, carved, skidded along Whiskey Bend Road, lowered to the lakebed, and installed where they will be subject to the natural forces of the sediment they are buried in.

graphic by author

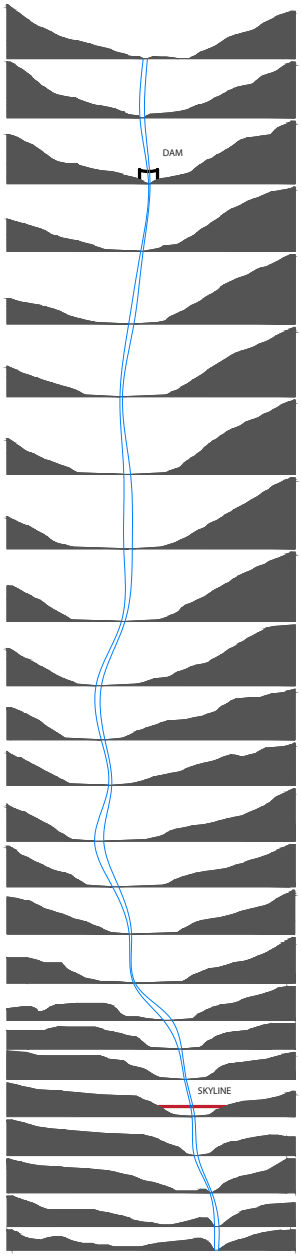


Fig. 50 TOPOGRAPHY OF LAKE MILLS

The topography of Lake Mills shows the narrow canyons on either end of the lake and the relatively flat river basin surrounded by steep banks.

graphic by author

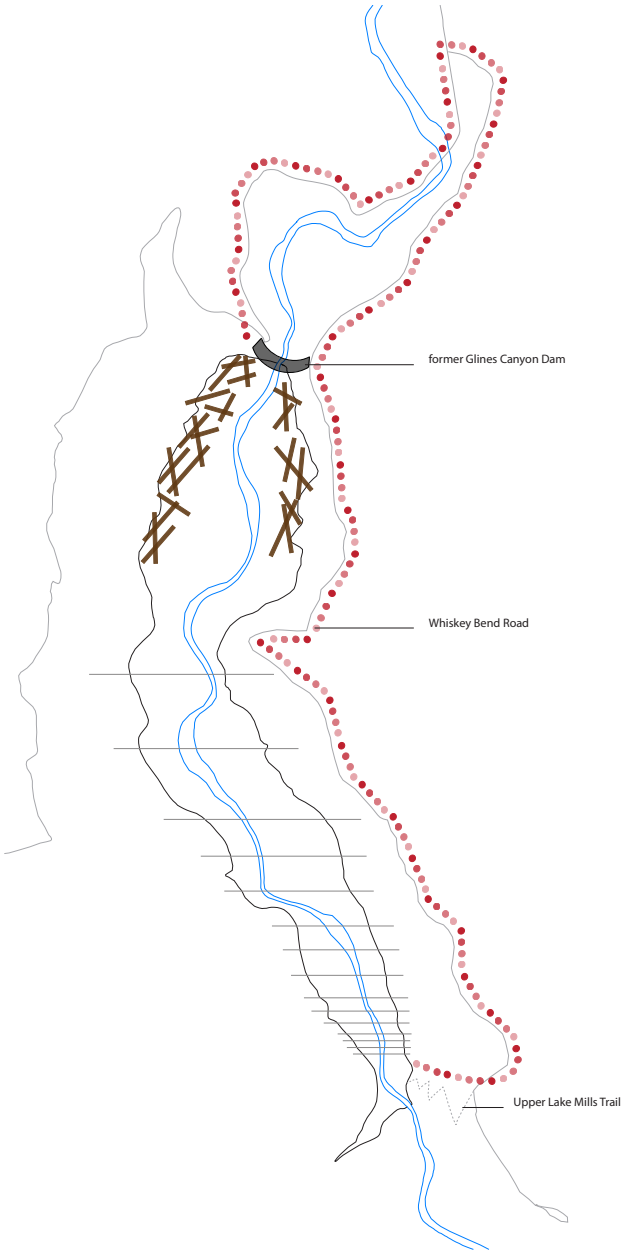


Fig. 51 RELOCATING THE LOGS TO REFOREST THE LAKEBED

Logs are transported from the lower lakebed to the upper lakebed and installed along a grid. This grid begins as a series of tight rows that expand as the “forest” grows downstream.

graphic by author

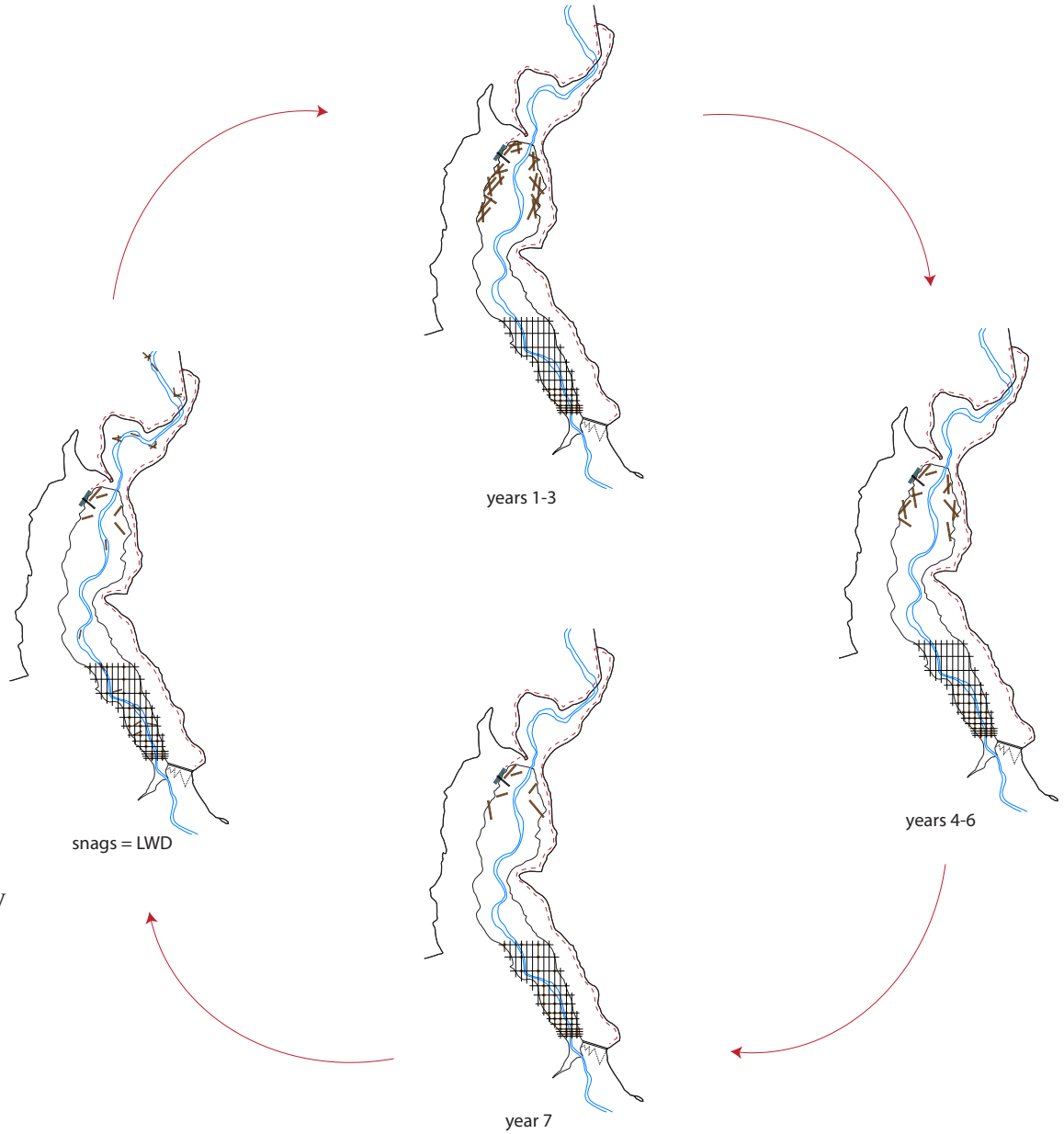


Fig. 52 GROWTH OF THE FOREST

Over the course of seven years the “forest” will grow northward. As rows of logs are installed each year the previously installed rows begin to lean, fall, and get swept away by the river. The logs swept downstream become large woody debris (LWD) while those that fall, but remain in place, become nurse logs.

graphic by author

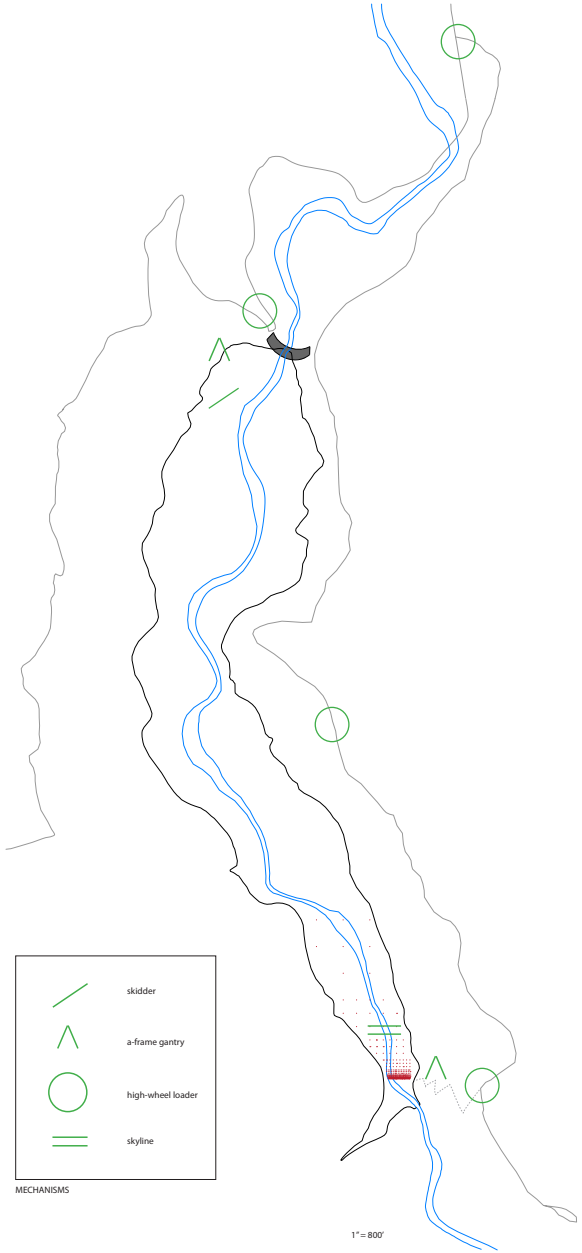


Fig. 53 EXPANDING GRID AND LOCATION OF MECHANISMS - 1” = 800’

graphic by author

Fig. 54 DETAIL OF THE GRID 1” = 200’

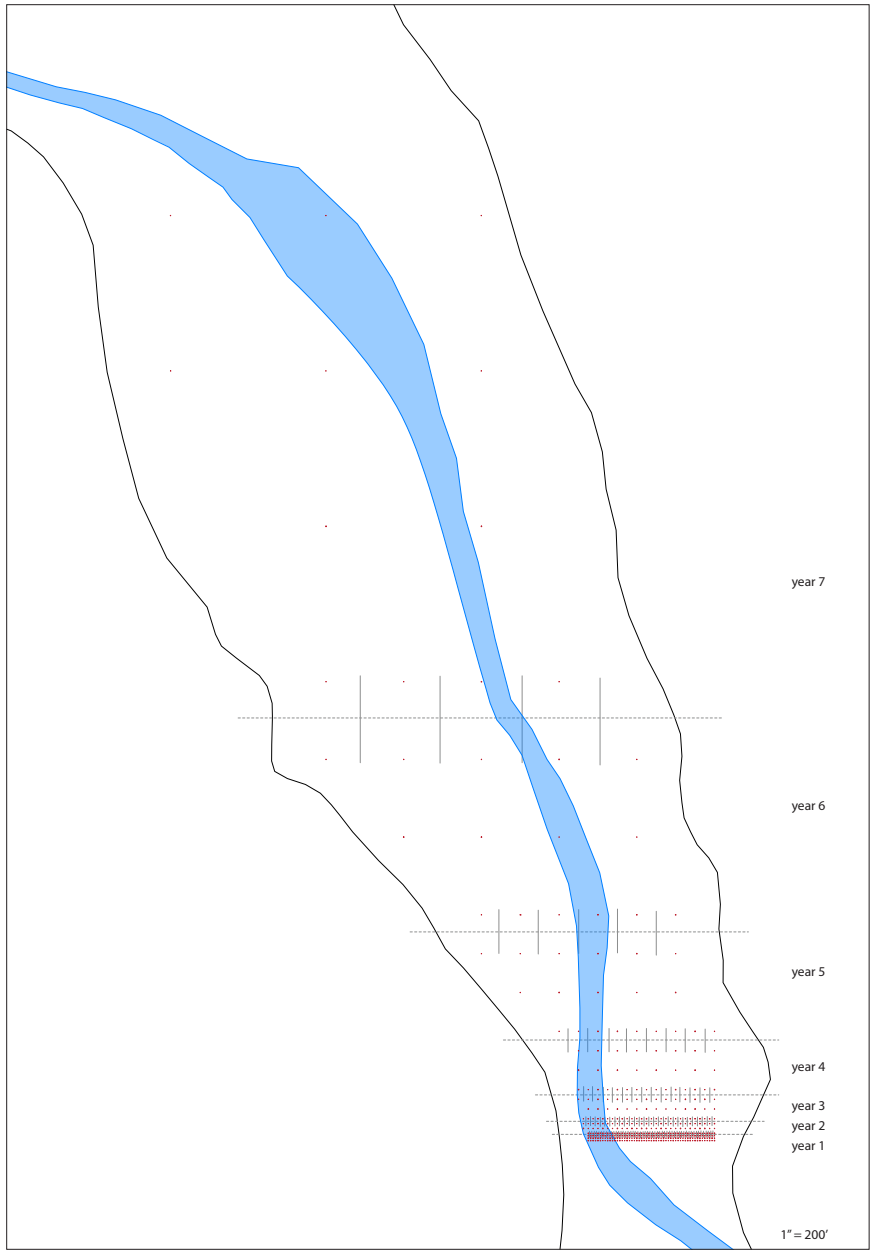
The grid expands over the years as the “reforesting” continues.
It begins as a series of close rows, but over time the rows gradually become further and further apart.

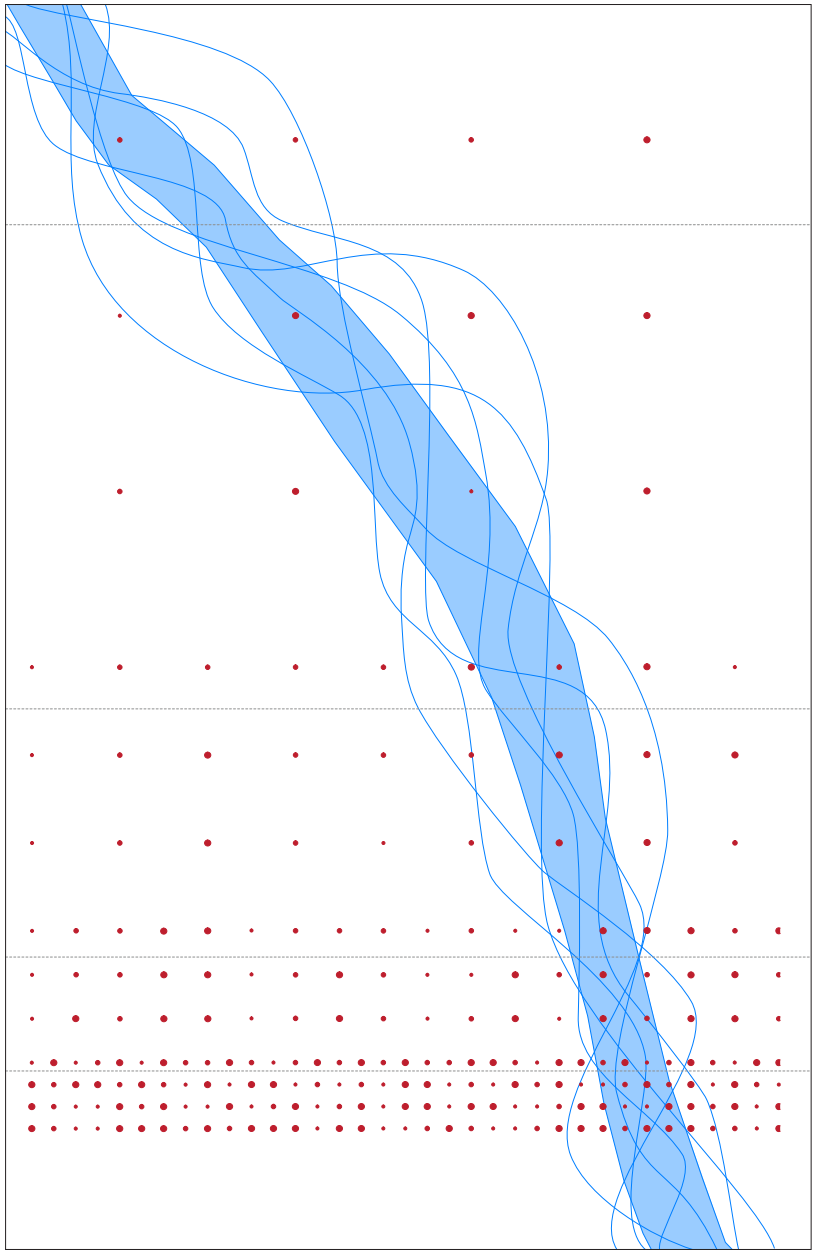
graphic by author

Fig. 55 DETAIL OF THE GRID 1” = 20’

As the river channel changes it weaves through the grid.

graphic by author


year 7
year 6
year 5
year 4
year 3
year 2
year 1
1" = 200'



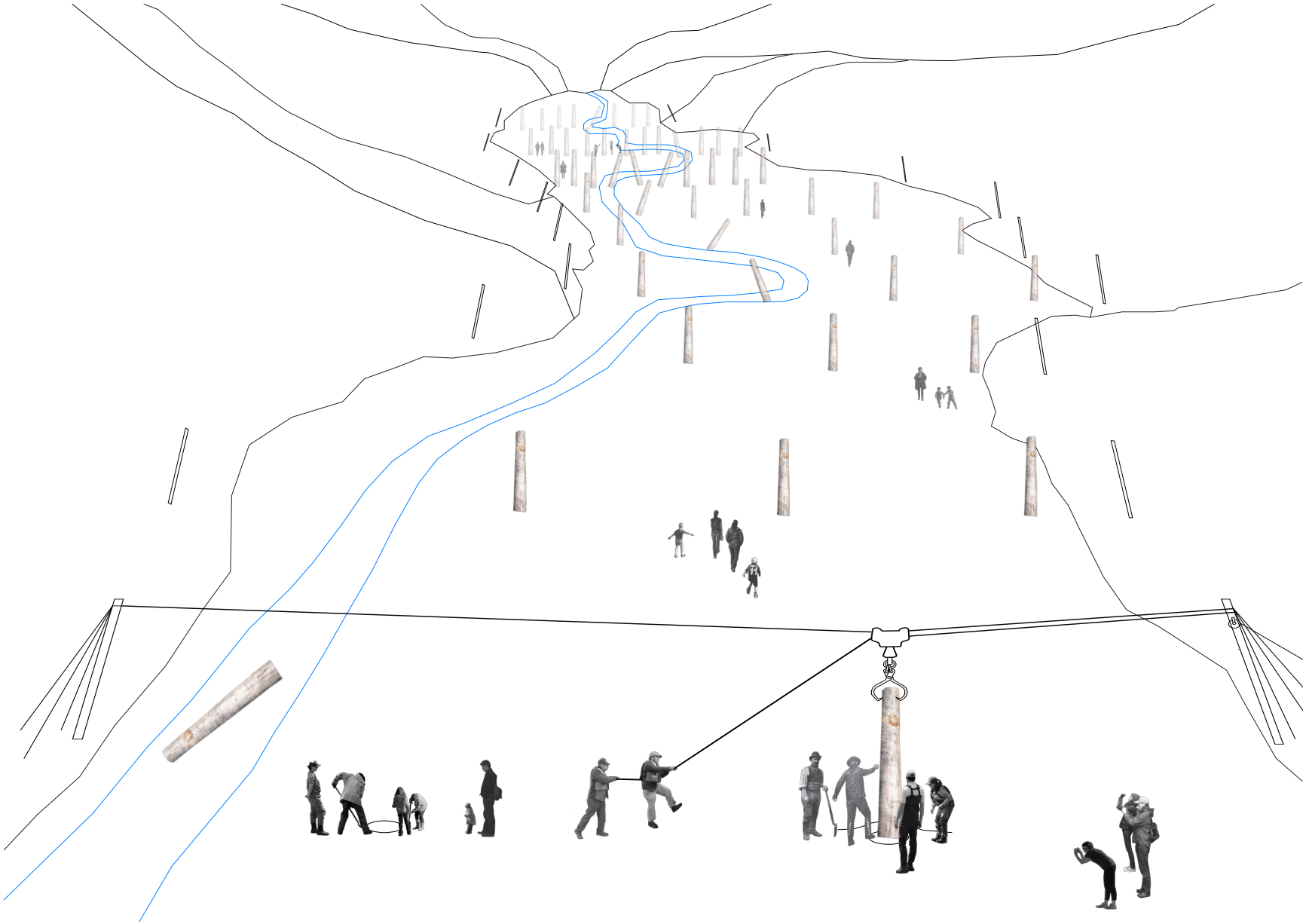


Fig. 56 EXPANDING GRID

The grid expands downstream as it is installed, and the only mechanisms left in place are the skyline poles.

graphic by author

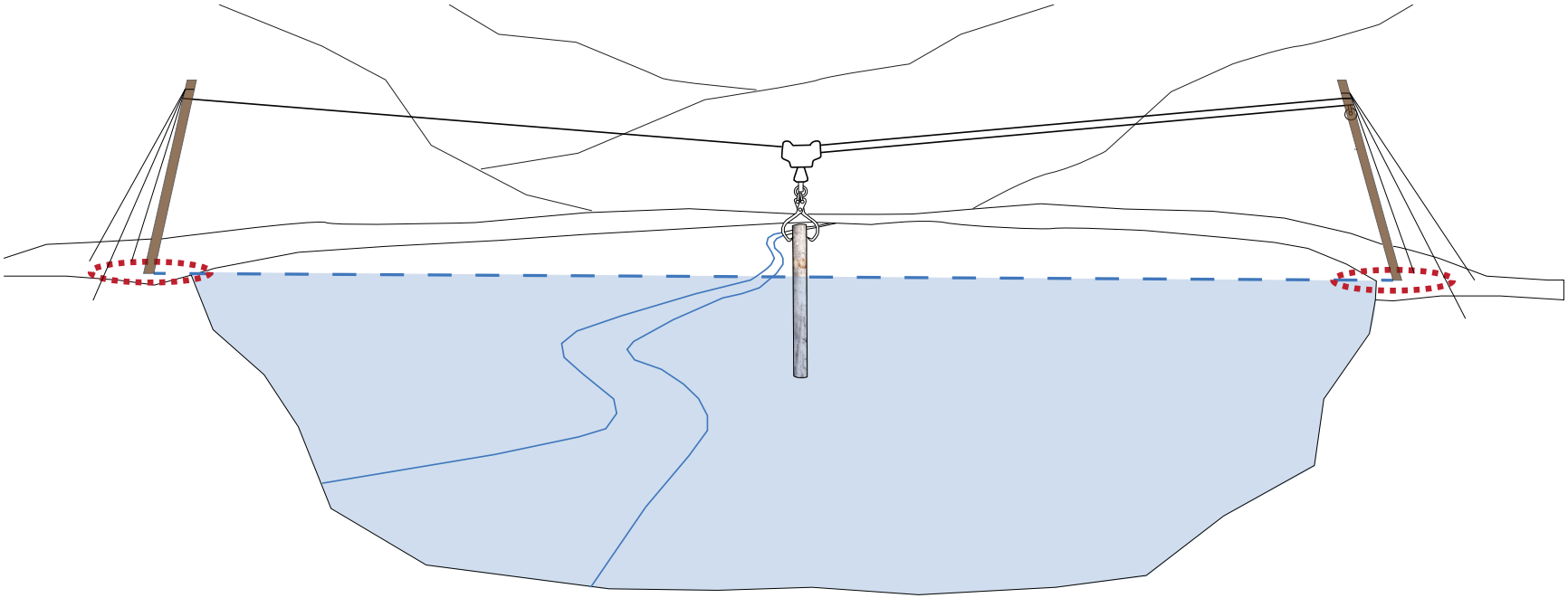


Fig. 57 MARKING THE WATER LEVEL

The sklyline poles, which remain in place to decay in situ, mark the former water level of Lake Mills.

graphic by author

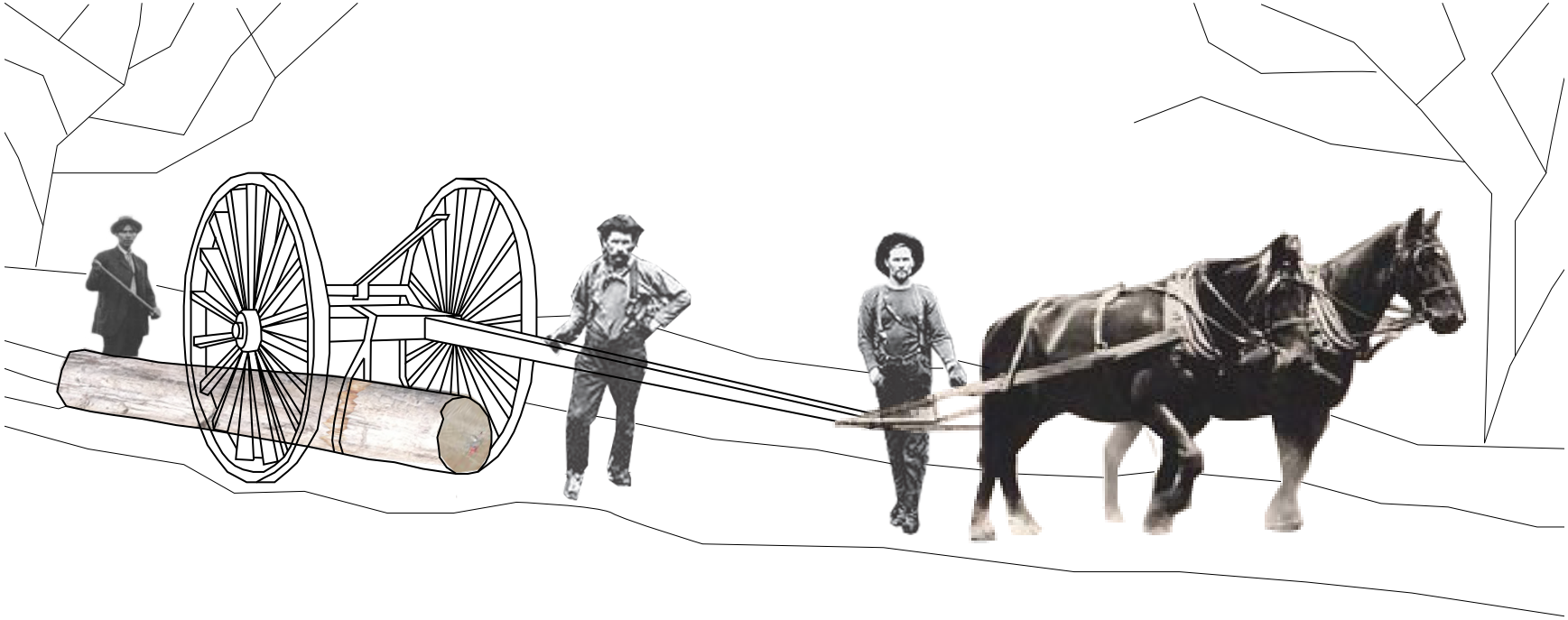


Fig. 58 HIGH-WHEEL LOADER

A high wheel-loader drags the logs along Whiskey Bend Road to the upper lakebed.

graphic by author

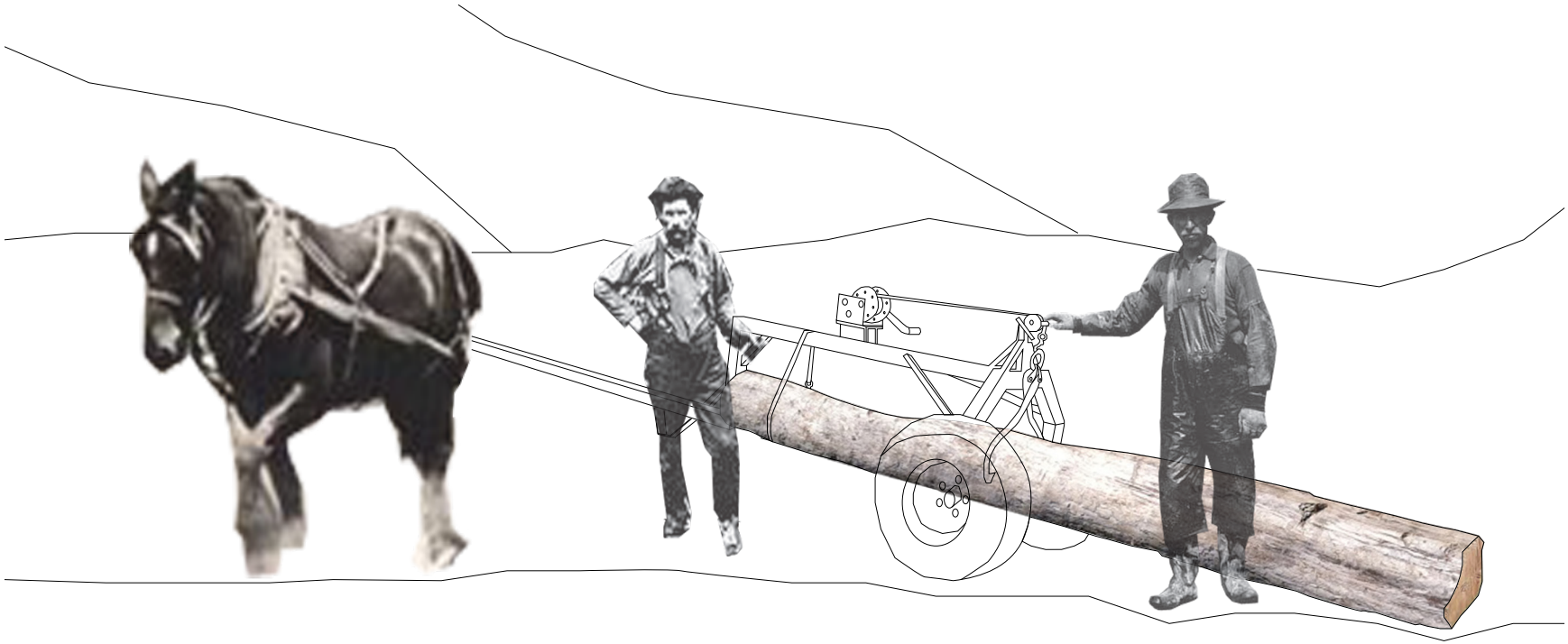


Fig. 59 SKIDDER

A skidder drags the logs from the lakebed to the A-frame gantry.

graphic by author

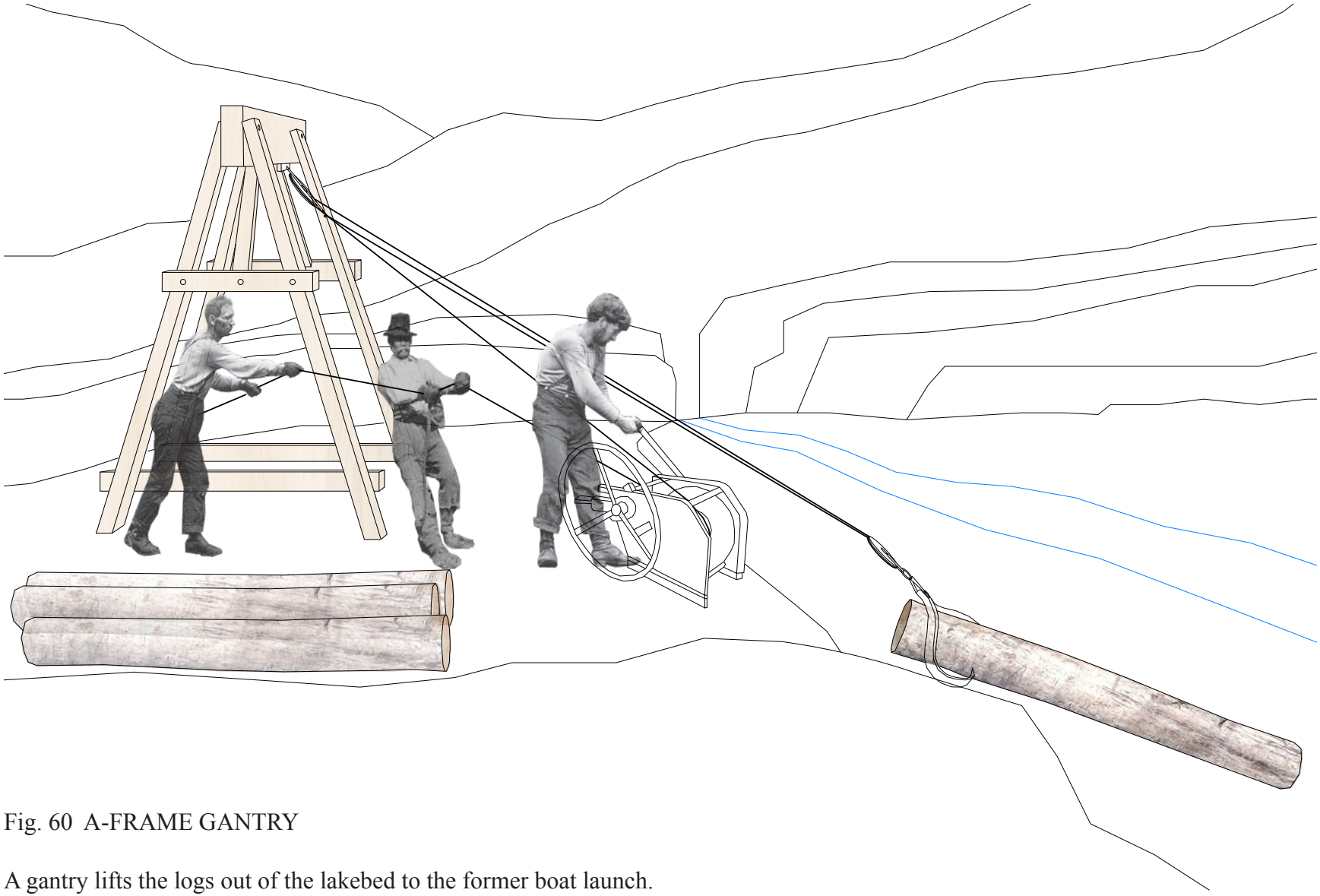


Fig. 60 A-FRAME GANTRY

A gantry lifts the logs out of the lakebed to the former boat launch.

graphic by author

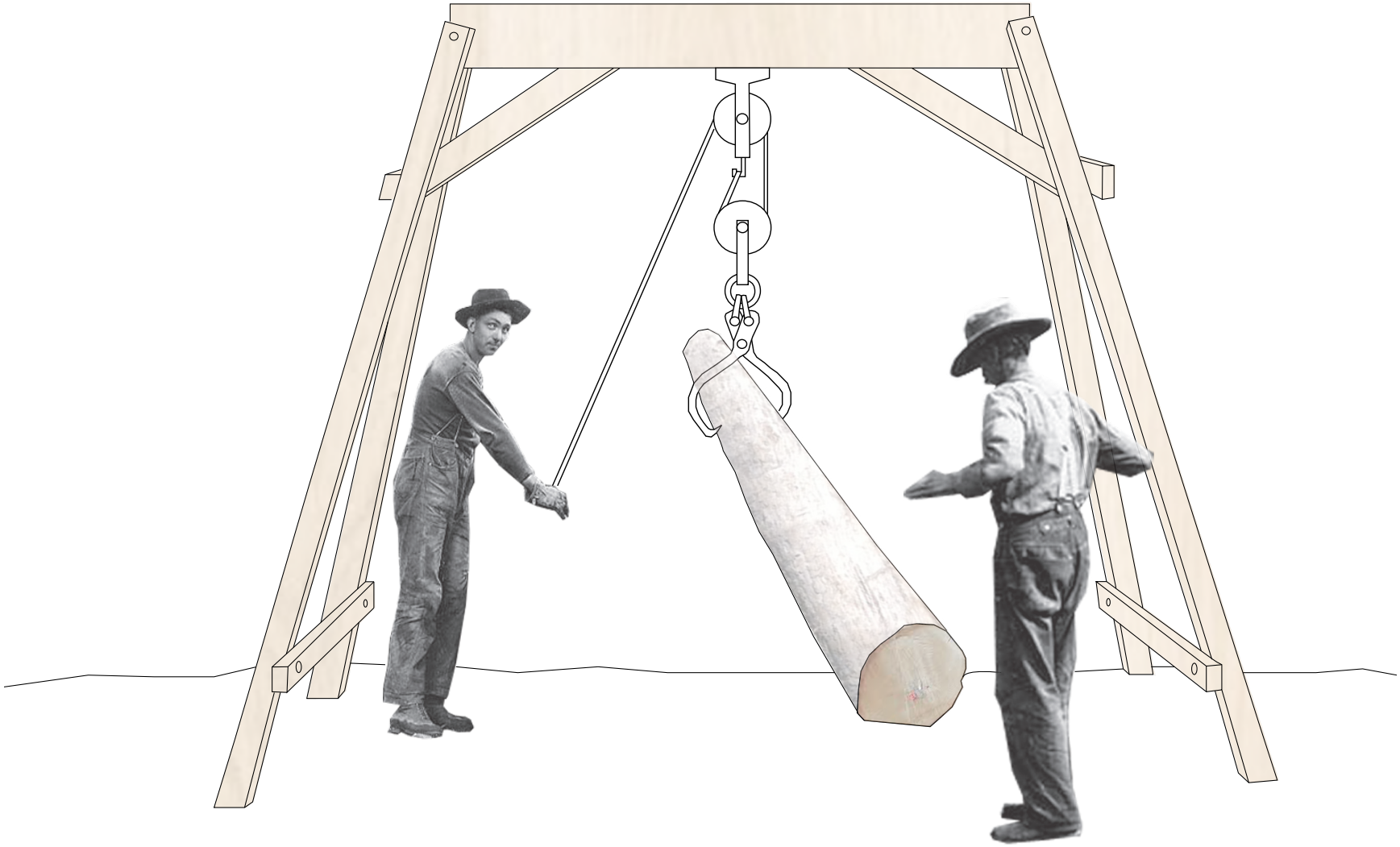


Fig. 61 BALANCE POINT

The balance point upon which the gantry lifts the logs out of the lakebed becomes permanently marked by the tongs.

graphic by author

Fig. 62 CARVING

The point where the logging tongs, attached to the gantry, lift the logs out of the lakebed leaves an indelible mark upon the log. This balance point upon which the logs are lifted is further marked through the carving of this scar. This carving presents a mark that is clearly human made. Long after the “forest” has deconstructed, marked logs will be found downstream, remnants of the “forest.”

graphic by author

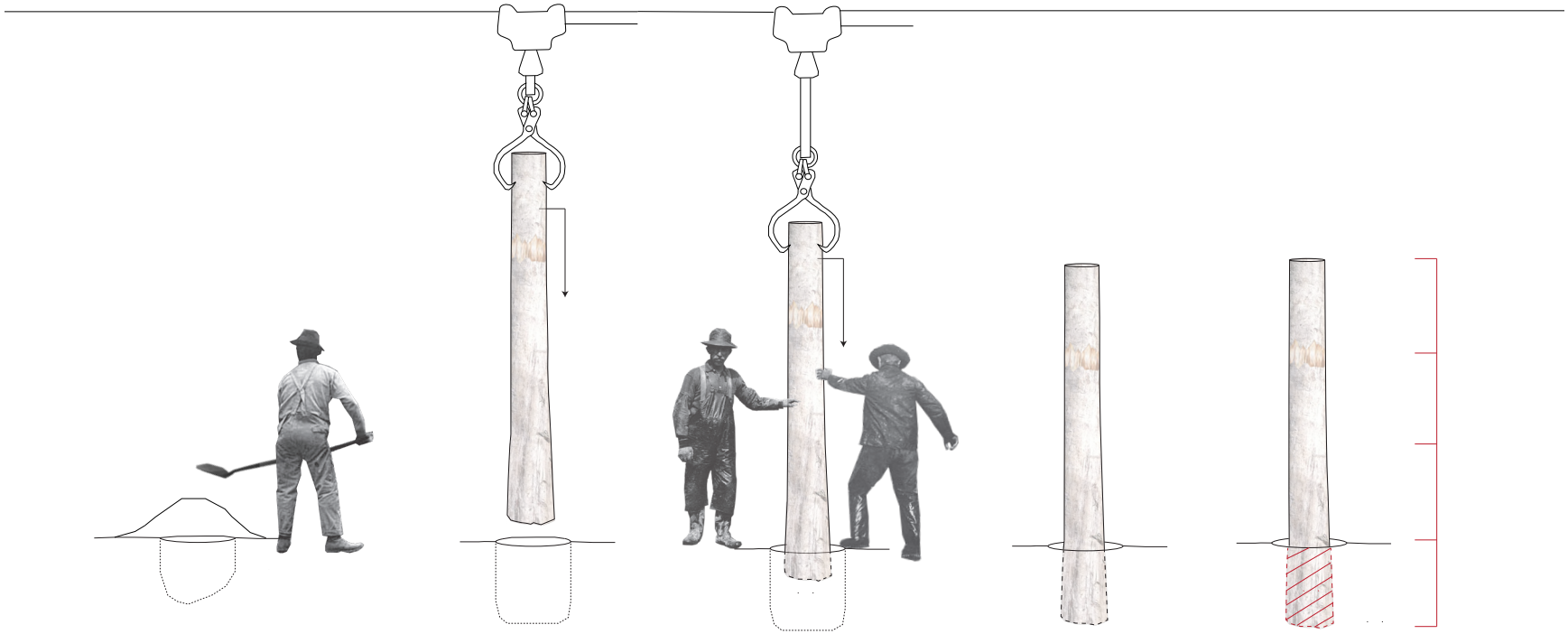


Fig. 63 SKYLINE

The skyline moves the logs into position and lowers them into a hole.

graphic by author

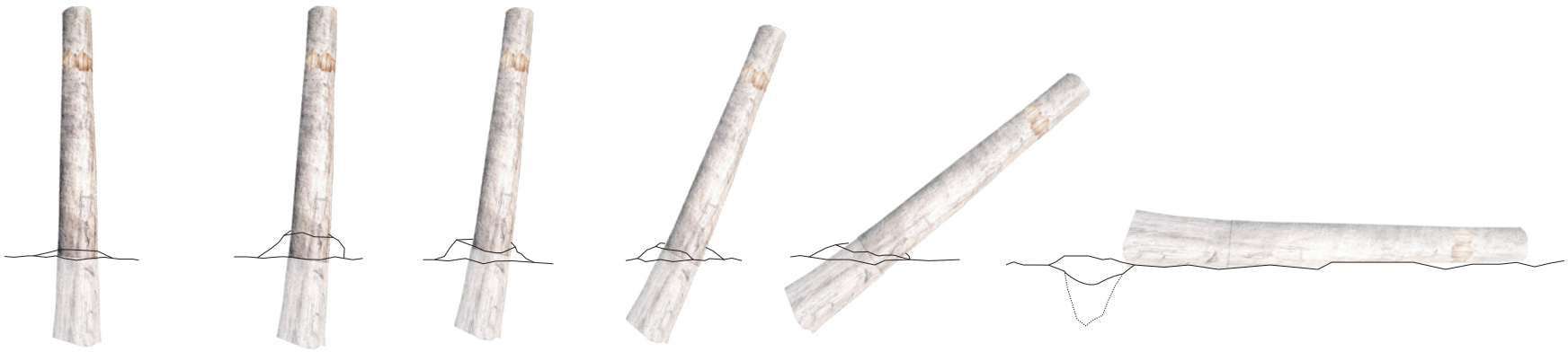


Fig. 64 LEANING AND FALLING OVER TIME

As the sediment moves over time the logs will lean, dislodge, and fall over.

graphic by author

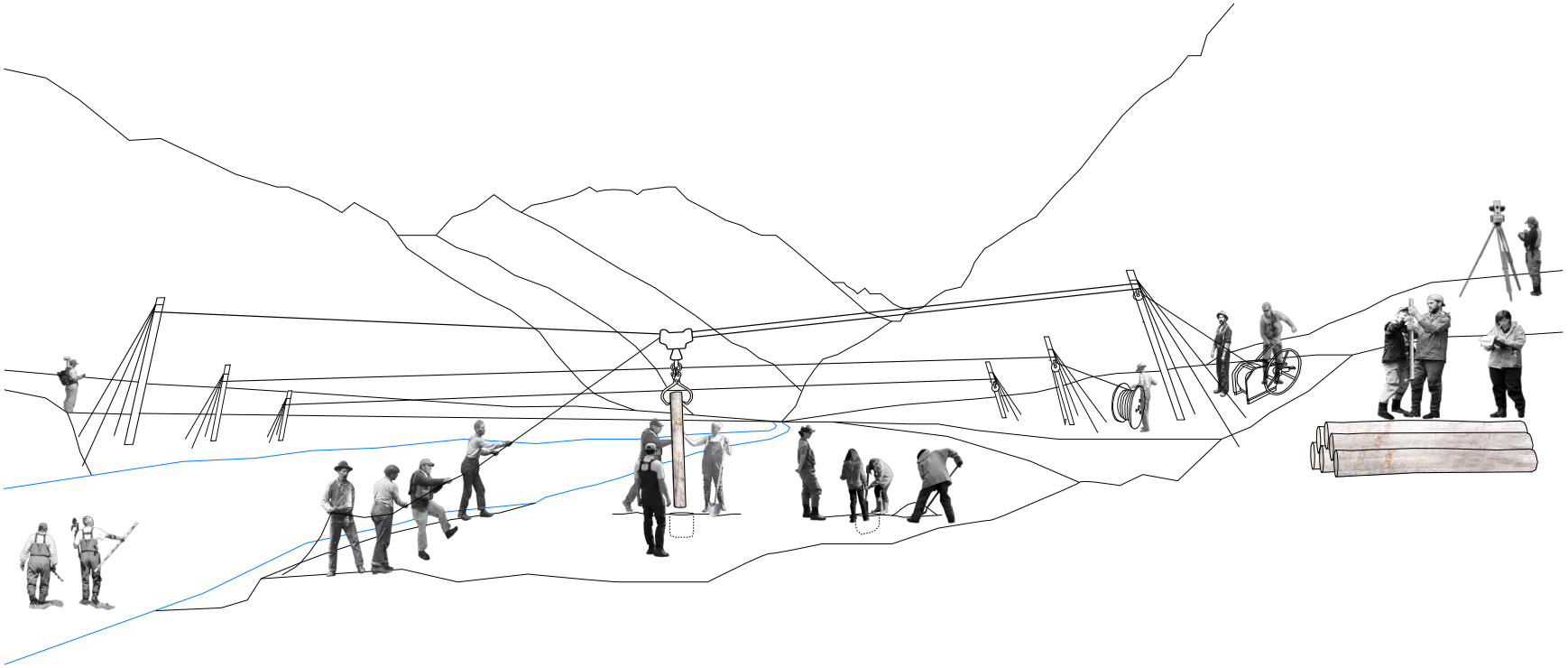


Fig. 65 INSTALLING THE FOREST

The “forest” is installed row by row over a series of seven summers. As the next row is installed, the previous rows many be in the process of leaning, dislodging, and falling over. The “forest” is constantly in motion, never fixed or static.

graphic by author

Fig. 66 DRAGGING THE LOGS

Logs dragged along Whiskey Bend Road leave the trace of their journey from the lower lakebed to the upper lakebed.

graphic by author

Fig. 67 SHIFTING FOREST

As the sediment shifts, the logs shift too. Over time, logs will lean and fall further exposing a dynamic landscape that is continuously in motion.

graphic by author

Fig. 68 REGROWTH

Logs that fall but remain in place will serve as nurse logs, capturing seeds that blow into the lakebed from the nearby forest and protecting small plants from predators, allowing them to establish their roots and grow. Some logs will be swept downstream where they will serve as much needed large woody debris (LWD). LWD is vital salmon habitat, creating slower moving pools where fish can rest and shaded areas where fish can hide from predators. LWD also provides nutrients to acquatic creatures and the soils of the adjacent shoreline.

graphic by author

REFLECTION + CONCLUSION

> *Time reflected in change and change reflected in time may just be the keys to understanding the natural world and our place within it* (Treib 40).

In its most basic form, this thesis sets something up and then lets go to see what happens, and in the happening attempts to expose and interpret the sedimentation of Lake Mills. There is a tension between control and unpredictability in this project, a tension that I hope makes for a more engaging landscape. I believe that I have, at least in part, achieved this based on the thoughtful discussion that ensued during both my mid-review and final review. In fact, to my surprise, some reviewers were convinced, some insistently, that this project is capable of being built. For me, this thesis was a conceptual exercise that pushed me to find the line between reality and theory. The design needed to be believable, one that could be envisioned, but it did not require the detail of a built project. At times it was challenging to maintain a more theoretical, conceptual perspective while engrossed in the details of how the reforesting could take place. It required a conceptual zooming in and out, similar to moving between different scales.

This thesis also challenged me to work within a set of design parameters, that as discussed earlier include:

the intervention should be ephemeral

the intervention should be composed of materials from the site that are able to decay in situ

the intervention should be simple, yet elegant

the intervention should expose and interpret an ecological process

the intervention should provide an ecological benefit while not causing any lasting ecological harm

the intervention should be experiential and didactic

At times it was difficult to adhere to these six principles, particularly that the materials should come from the site and be able to decay in situ. In contrast to the dam's mark upon the landscape I was concerned with imagining a design that would leave few, if any, traces of its installation aside from the skyline poles. This limitation forced me to consider materials very carefully, what they are composed of and how they can be repurposed or recycled. This was true not only for the final design, but also for the mechanisms that help construct the design; I found this to be a useful lesson in restraint and sensitivity to the site.

This thesis has been a year-long process of discovery and design. A fellow student's thesis first piqued my interest in studying time and change, which led to ephemerality. There is far more to be investigated and discovered in regards to ephemerality and design, and I believe it is a topic worth pursuing, beyond this thesis. My larger question, outside the scope of this thesis, is what is the role of ephemerality in the profession of landscape architecture? Can there be a spectrum of design methods, the use of which is dictated by the site? Some sites might require a more permanent design, others might have permanent and ephemeral aspects, while others might be entirely ephemeral.

Throughout this project I searched for design examples to substantiate my ideas and draw inspiration from; I immediately thought of Land Art, but it was more difficult to find landscape architecture projects that resonated with me. Ephemerality was readily identifiable in the art works that served as precedents for this thesis—Spiral Jetty, The Lightning Field, Splitting, Conical Intersect, Valley Curtain, and Over the River. Naturally, landscape architecture engages ephemerality in materials, seasonal changes, human and non-human use, weathering, growth, decay, and death. Despite landscape architecture's inherent relationship with ephemerality, it was

challenging to find landscape architecture projects that were deliberately designed with ephemerality as a guiding principle. Perhaps designers overlook ephemerality as a design principle, because it is such an inherent aspect of the profession. Engaging ephemerality deliberately and directly produces different results than simply relying on the ephemerality we are all accustomed to. Udo Weilacher claims that few landscape designers address transience "in an experimental way, letting the transitory take its unpredictable course" (40). At this point, I agree.

Although I do not presume to have exhausted the literature, I still have yet to find a landscape architecture project that engages ephemerality as directly as have artists. Indeterminacy is a popular and related theme within landscape architecture, and while the idea of an open-ended design shares some similarities with ephemerality, for me, it is not an equivalent comparison. This apparent gap in the literature and practice suggests there is room within the profession for an exploration of ephemerality. There are, of course, barriers to this exploration. On a practical level, designing for longevity often makes sense. As a culture, Americans expect value and longevity in their purchases. This idea is reflected in landscape architectural projects as well, as few clients will pay for a design that is fleeting. This is, in part, why I suggest sites of post-infrastructure/industry/war/natural disaster are especially suited to ephemeral design. These are places in flux that can serve as "laboratories" to experiment with ephemeral design until the sites becomes more "stable" and more permanent design is appropriate. I suggest that testing ephemeral designs will lead to an appreciation of the fleeting, transitory nature of phenomena, landscapes, and life. If we can learn to embrace the ephemeral in the landscape then perhaps we can also learn to embrace our own ephemerality. Futhermore, if we as designers are committed to designs that are site specific and sensitive to the histories, narratives, and ecologies of the site then we must consider ephemeral design as a valuable design typology.

If this proposed design were in fact implemented, we might as a community begin to read the site, the landscape, its narratives, and its

futures in a different light. We might come to acknowledge the ephemeral nature of all that is around us and our role as instigators of change, both positive and negative. It is our responsibility as designers to consider these critical and essential questions as we mark the landscape whether in the wilderness or in the urban center. Acknowledging and engaging the ephemeral opens doors to alternative practices that will reflect diverse values and frameworks, an approach that is necessary if we are to understand and address the complex nature of disturbed sites, particularly as their numbers increase and their qualities further challenge our definition of, and what we do not yet understand as, disturbed.

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Photographs to footnote 2:

Fig. 69 A Nonsite, Franklin, New Jersey
Robert Smithson

Fig. 70 Earthwork aka Untitled (Dirt)
Robert Morris

Fig. 71 Eco graffiti “Elwha Be Free” painted on the Glines Canyon Dam in 1987 by Mikal Jakubal