

S U M M I T ' S R A L L Y

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Preserving the ecological systems of The Ross Lake Rec. Area and the North Cascades National Park through recreational education.

A Design Thesis Submitted to the
Department of Architecture and Landscape Architecture
of North Dakota State University

By

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In Partial Fulfillment of the Requirements
for the Degree of
Bachelor of Landscape Architecture



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May 2017
Fargo, ND

Thesis Archival Note

The following thesis project, entitled “Summit’s Rally : Preserving the ecological systems of The Ross Lake Rec. Area and the North Cascades National Park through recreational education,” was composed over the course of the 2016-2017 academic school year. The Thesis Program, as contained here, was initiated and completed in the fall semester as a part of the LA 563: Programming and Thesis Preparation course. Supplemental material, including the Thesis Boards and the Thesis Presentation documents, were generated in the spring semester as a part of the LA 572: Design Thesis studio.

Any inconsistencies between the different documents, in terms of research and design, should be disregarded per the evolution of the project across the two semesters.

TABLE OF CONTENTS

ABSTRACT	7
PROJECT OVERVIEW	8-23
RESEARCH	24-30
ANNOTATED BIBLIOGRAPHY	31-35
CASE STUDIES	36-39
PROGRAM	40-41
SITE ANALYSIS	42-43
GIS ANALYSIS	44-45
CODES	46-47
SCHEDULE	48-49

FIGURES

CHARTS

21-A	.....	21
40-A	.....	40
40-B	.....	40
40-C	.....	40

IMAGES

37-A	.....	37
38-A	.....	38
39-A	.....	39

PROJECT GRAPHICS

41-A	.....	41
42-A	.....	42

ABSTRACT

This project explores the central issues surrounding the Northern Cascades National Park (NCNP) complex, and their relationships to the conservation efforts and protocol of the park's system. These issues are: local industrial operations for natural resources, sub-alpine tree overgrowth/invasion, and facility underuse. All of these current disparages within the park directly relate to critical habitat hubs. This project examines all of these main issues, with an emphasis on the impact each one carries on specific refuge zones in the Northern Cascades. Integrated conservation and development projects (ICDPs) are hypothetical design outlines created for specific sites or site typologies seeking to implement a balance between environmental elements and human development. This works from both directions; ICDPs can either introduce natural elements to a primarily developed site, or vice versa. Aside from an analysis of existing site disparages, this project will also serve as an evidence-based foundation to create a site-specific ICDP for Northern Cascades National Park.



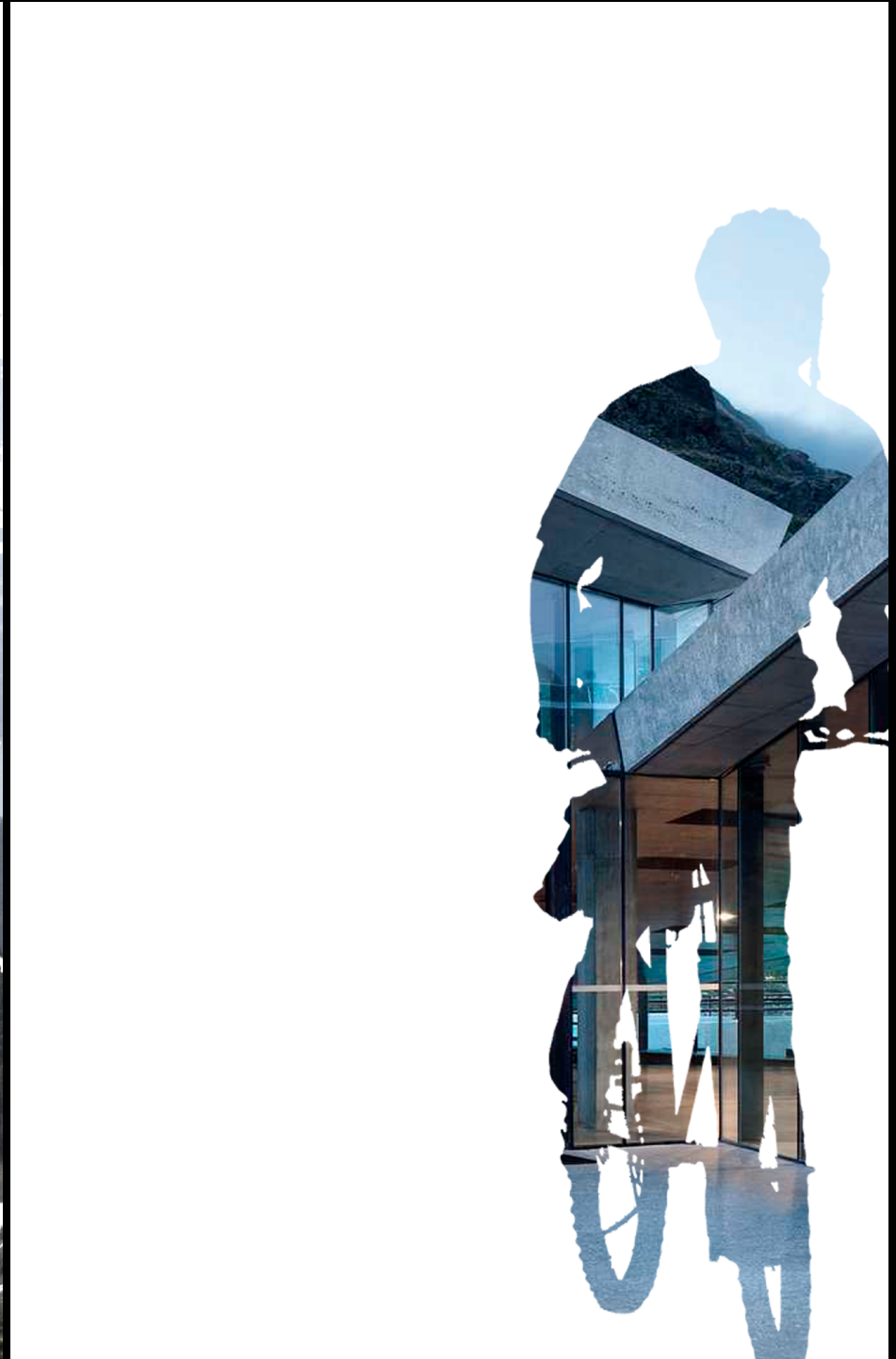
Overview

The objective for Summit's Rally is to implement a mutualistic relationship between people and nature. A person left in the wilderness with nothing would not survive long; at the very least, it could hardly be called an enjoyable experience. Similarly, the wilderness is not capable of coexisting with human civilization when the presence of humans is simply too overwhelming. Several case studies have proven that creating a balance between the two is possible. Currently, Northern Cascades National Park has the lowest visitor rate of any park in the United States. The park was created to preserve the ruggedness of the Washington Wilderness. The irony of the situation is that because there are such low visitor numbers, logging and timber operations are allowed to move about the park relatively unimpeded. Legislation relevant to the operations of any national park are heavily influenced by a public voice. As it stands, Northern Cascades National Park has no voice. Old-growth tree zones around the park are being cut down, which has put a strain on the Northern Spotted Owl; a highly endangered species. These are the most prevalent issues, and they are all connected to each other. Ironically, precedent analysis shows introducing more visitors to the park and directing their path will actually help control the negative impact humans have on the area. Timber regulations established by federal legislature would put lumber operations onto a sustainable cycle, where Northern Spotted Owl habitats wouldn't be disrupted, and new growth zones would be allowed to recover from previous harvests. This project is important to the field of landscape architecture because if implemented, it can serve as a strong example for how nodal action can make a great difference on an area millions of acres across.



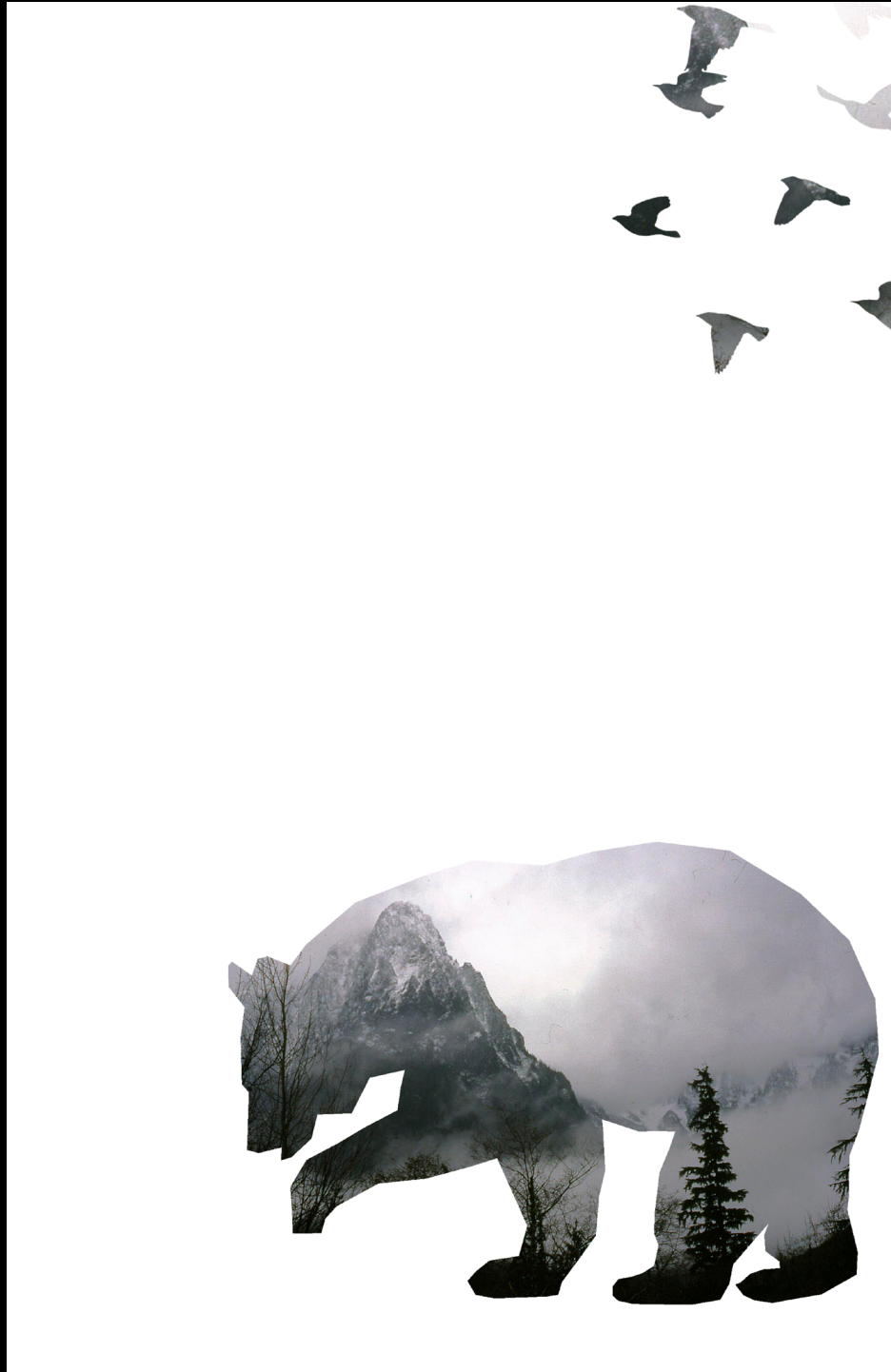
Project Typology

Summit's Rally is a National Park intervention. Given the programming and objective parameters, this design project is most similar to a resort, or a retreat. Many amenities are placed in a relatively small area (2-3 acres) with the intention to attract, entertain, and educate guests. The National Park typology immediately presents both opportunities and restraints. (Construction and zoning codes are presented in detail in the codes section). Projects listed in the case studies section show the potential and value in allowing controlled human interaction. For example, a cable car offers phenomenal views, opens up the amount of area available to be explored by visitors, and produces a minimal footprint (compared to a complex trail or boardwalk system spanning several miles and winding up the sides of mountains). Another unique program element that slightly varies the typology is an observatory. This facility would serve both as a visitor destination, as well as a research center, lending value to the whole facility. Both of these proposed design elements relate back to the overall hedonic approach to the project, while still being relevant to the context of the park.



Emphasis

The project emphasis will be on preservation, improvement, and education relating to the existing National Park. This will primarily be accomplished at the macro and meso scale, where proposals for park border expansion, timber harvest cycling, and protection of Northern Spotted Owl habitats will be presented. The Northern Spotted Owls in particular will be in the spotlight for this project, as they are the most prominently threatened element identified for this design intervention. Educational emphasis will be implemented at the micro scale, along with the facility design. The idea is to instill awareness to visitors at the micro scale of circumstances occurring at the meso and macro scales. Ideally, people would learn by seeing. GIS and other mapping compilation will be used to narrow down a site 2-3 acres in size with as many of the aforementioned issues occurring on or around its borders .



Objectives

- To preserve and create habitats, especially for the endangered Northern Spotted Owl.
- To establish guidelines to mitigate natural resource harvesting operations.
- To attract higher numbers of visitors by creating accessible destinations.
- To educate and spread awareness of issues threatening the well-being and viability of the park.



Clientelle & Users

The clientelle for Summit's Rally is fairly typical, and could be considered one of the limitations of the effort. As a national park, the federal government is the mass client for the project. Their needs and requirements are based more around financing, need, and planning. A project pitch to the federal entity in charge of making decisions for national parks would be primarily focused on need. Several pseudo-clients also exist with this project; the Northern Spotted Owl, and the Northern Cascades forests. Both of these parties are affected by any large-scale design intervention, and their needs should be considered even if neither of them are involved in the process. Users would be the visitors. These would be a mix of locals spending a day in the mountains, or tourist groups staying one or more days and making. Programming elements to meet the needs of these users include a rest stop with a cafeteria, and lodging. Employees make up the other half of the facility users. These people vary including, scientists, rangers, and tour guides, but on the whole Summit's Rally employees would generally be local hires. Researchers may do work in the observatory for weeks on end, and they would be provided with onsite room on board if they so choose. Otherwise, there are hotels and other amenities in the local towns of Concrete and Rockport.



Justification

To put it bluntly, Northern Cascades National Park is failing. Although it was originally created as a preservation project to uphold the ruggedness of Northern Washington, it will be taken over by timber, mining, and other resource operations. National Parks simply cannot be sustained without a steady visitor flow. This project can help bring in visitors to the area, without sacrificing the soul of the park or the original intentions of its establishment.



**NATIONAL
PARK
SERVICE**

Design Plan

The project's research thus far has been purely based off of article based compilation. Moving forward, interviews with park staff and survey data will be collected to bolster design decisions. Design methodology will be relatively typical. The second semester will begin with more detailed schematic programming, placing listed program elements in bubble diagrams. Design work will move quickly from the drafting desk to the computer. GIS data will be created over the academic break, and utilized to create autocad basemaps. A rough masterplan will be drawn in Cad. Here, the graphics checklist will be split between 3d modeling and 2d drawing. A sketchup model will be created from the masterplan, touched up in Lumion, and rendered in photoshop by the end of the Thesis cycle. The design process will be documented with branched digital copies, scans, and photographs. The adjacent graphic is a general tentative schedule for proceeding into second semester; a more detailed version will be created after the first week.

General Schedule

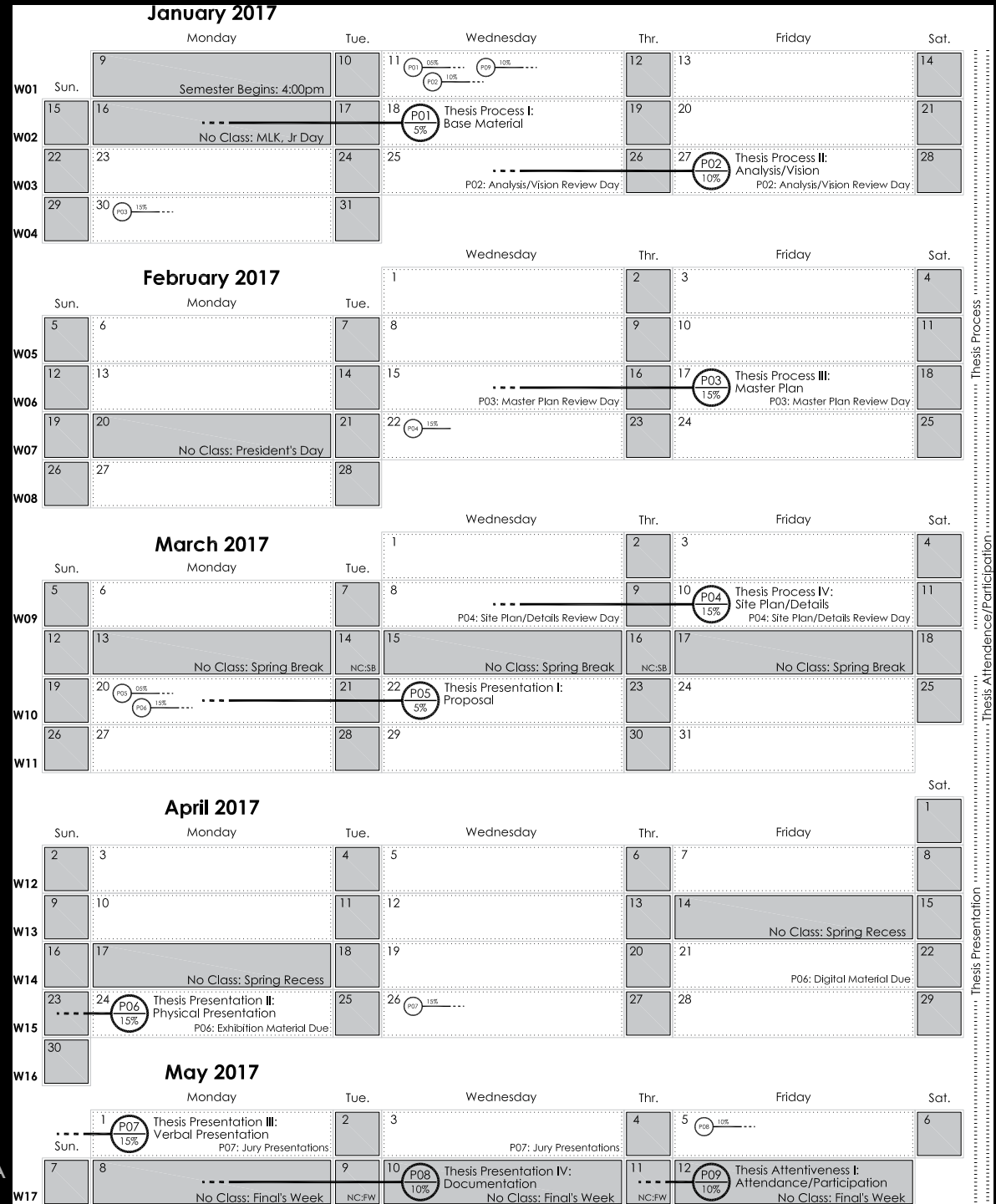


fig. 21-A

Task List

- Process Sketches
 - Partii Sketch/Project Logo
 - Macro Plan
 - Meso Plan
 - Micro Master Plan
 - GIS Plan
 - Emergent Programs Plan
 - 3 Sections
 - 3 Section Perspectives (showing function)
 - 3 Perspectives
 - Phasing Plan
 - Money Shot
- Introduction Video, to provide a quick animated summary of the project presentation

Introduction

Although Northern Cascades National Park is a wonderful asset well known for its striking beauty and unique environmental values, the facility currently suffers from several macro-scale issues, the likes of which are jeopardizing the quality and potential of natural monuments throughout the complex. Sources indicate serious ecological destruction from industrial/mining operations, invasive species of flora, and adjacent development. These central issues over time have introduced a sub-category of problems for the park, including declining hydrologic quality, trophic cascades, and upheaval of critical habitat. In addition to these issues, the NCNP boasts the lowest visitor rate of any national park in the United States. I am studying integrated conservation and development projects (ICDPs), because I want to find out what current practices exist (both successful and unsuccessful), to help understand how a balance between human need and natural preservation can be

achieved in order to simultaneously strike a balance and improve the experiential quality and environmental integrity of critical habitat zones within Northern Cascades National Park.

Park Guests

“Popular parks like Yosemite face overcrowding issues that would have amazed John Muir [naturalist and early advocate of preservation of wilderness in the U.S.] (Geographic, 2016) Managers must balance open access with negative impacts on visitor experience and on park environments. Today’s visitors also use parks in new ways. Snowmobilers prowl Yellowstone and pilots fly visitors over the Grand Canyon. Mountain bikers, motor boaters, and many others all hope to enjoy their favorite pastimes in their favorite parks. Does allowing such activities enhance the parks experience or detract from it?” (Mapes, 2012) This touches on one of the larger issues relevant to national parks: recreation vs. preservation.

It’s possible to achieve a balance between human

need and natural preservation, but it’s also incredibly difficult. There are many design schools that attest to the hedonic approach; provide recreational opportunity, and people will get involved. However, many national parks only exist to preserve some natural monument or ecologic region in danger of being razed for human purposes. Humanity and nature are two completely separate entities. If left in the wilderness with nothing, the average person would not survive in a setting truly controlled by nature. Likewise, nature cannot flourish if humanity is to flourish in the same area. Many issues facing modern National Parks are brought on by this simple fact. ICDP efforts promise the possibility of a balance, and these practices must be analyzed, understood, and restructured in order to improve the experiential quality, environmental integrity, and economic viability of National Parks. Northern Cascades National Park is the least visited facility out of all 58 located in the United States entirely because of the exceptionally rugged nature of the mountain range. (Bonachela, 2010) While

the park was created for the sole purpose of preserving the wild beauty of the area, the relative lack of structured destination within the site does pose an issue for the health and quality of the park. If the public is not involved with the complex, then opposition does not occur when industries looking to harvest natural resources claim land stakes and upset the balance of critical wildlife habitats. Regarding current attempts to implement recreational and structural development, “[park improvement advocates] face formidable political challenges. Battles to get Congress to expand parks and wilderness areas usually take years and are often opposed by those who fear new restrictions on recreational use or development.” (Mapes, 2012) To reiterate, the priority in NCNP is to treat the wilderness with the utmost respect and care. However, the beauty and natural freedom of the park must be experienced by more people. A greater visitor count creates greater awareness, and opposition to timber and mining companies who are affecting the entire park with transboundary development

and disturbance. Enticing visitation isn’t dismissed by the National Park Service, and, “the following principles are important in guiding the management of resources and values within North Cascades National Park Complex:

1. Stewardship – North Cascades National Park Complex strives to use science in making informed decisions. This science-based stewardship advances our knowledge and appreciation of the North Cascades.
2. Partnerships – North Cascades National Park Complex views partnerships as integral for achieving the purposes of North Cascades National Park, Ross Lake NRA, and Lake Chelan NRA.
3. Transboundary Ecosystem Management –Through its relationship with the Skagit Environmental Endowment Commission and interactions with British Columbia Ministry of the Environment, the U.S. Forest Service, and other parties, the North Cascades National Park Complex is dedicated to the pursuit of cooperative transboundary activities focused on a wide range of visitor, resource, and operational issues.”

(Service, 2012) Educational modules would be a simple, yet effective solution to meet many of these principles. The bottom line is that NCNP needs to gain a voice through visitation and learning. Balanced development is met with tepidness and scorn, despite being directly referred to in the official NCNP foundation document as one of the three guided management principles for the complex. It's ironic then, that much more harmful developments are continually allowed to crop up along the borders of the park.

Transboundary Land Use

“No park exists in isolation, and the fact is becoming increasingly clear as the areas surrounding National Parks are developed for living space, agriculture, mining, forestry, and more. The iconic species protected inside the parks don't recognize boundaries and must often move in and out of parks to feed, mate, or migrate. If larger ecological wildlife corridors can't be maintained to include the lands outside of parks, many species may not survive within them either.” (Geographic, 2016) Industrial development also

threatens modern national parks. “What happens on a park's borders can dramatically impact the environment inside the park itself. Mining, petroleum prospecting, clear-cut lumbering, and other operations are generally prohibited inside parks, but they still pose serious threats to water quality, clean air, and other vital aspects of the park environment.” (Geographic, 2016) As previously stated, national parks are host to unique and delicate ecosystems, easily disrupted. Many facilities are drastically affected by adjacent industrial operations. The primary antagonist to NCNP is widespread timber operations, but there are also several working and proposed mining facilities within just a few miles of the park's border. (Rochefort, Little, Woodward, & Peterson, 1994) While these industrial hubs are well within the bounds of the law, they are frequently set up with no opposition or consideration for far reaching effects on migratory birds and other critical habitats. Over time and continued use, these primary issues have yielded a completely new set of concerns within the borders of

Northern Cascades National Park.

Sub-Categorical Issues

Many national reserves are host to unique ecological chains, and can be easily disrupted by industrial development. Basic development also plays host to another serious issue surrounding national parks. People often unwittingly introduce highly disruptive non-native species into an ecosystem via boats or planes, while others are sometimes intentionally imported for exotic animal trade. If turned loose with no competition, “invasive species can run amok in an ecosystem and send a park’s native residents toward extinction.” (Geographic, 2016), (Franklin, Moir, Douglas, & Wiberg, 1971) Additionally, many invasive plant species thrive and spread by utilizing built structures, such as roads and hiking trails. In general, too much competition from unwanted invasive species decreases biodiversity, and can severely harm an ecosystem if left unchecked.

Related to industrialization, hydrologic issues are also prevalent within the country’s national parks. Water

toxicity, demand, and availability are all too high. Water consumption does not exist at a sustainable rate, and many parks are directly affected by this. “In Florida’s Biscayne National Park, where freshwater arrives from a highly compromised Everglades ecosystem upstream, a freshwater storage is becoming an issue even though 95% of the park remains covered with seawater.” (Center, 2015) Essentially, any park with wildlife dependent on a balanced freshwater supply is being endangered by current pollution and consumption rates.

Air pollution is also an important factor to consider in the health of a park. “Air quality issues originate outside the parks. At Great Smoky, power plant and industrial emissions are blown by winds to the southern Appalachians and trapped there by the mountains.” (Hemstrom & Franklin, 1982) This common difficulty relates directly to adjacent industrial development and operation. “Air quality problems choke off views, poison plants, and even foul water.” (Geographic, 2016) As with hydrologic resources, air quality

is also a vastly important factor to be considered in relation to the management of a national park.

All of these generalized points of concern have either been observed, or are developing within the NCNP borders. The razing of certain tree species has allowed lodgepole pines and douglas firs to grow unchecked through the complex, and both are now considered invasive species. (Case & Peterson, 2007) The upheaval of these growth sites has severely affected sub-alpine meadows, which has in turn disrupted the migration patterns of nesting birds. The devolution of critical habitats led to trophic cascade and a breakdown of the local food chain. Several species of animals are now facing declining numbers, including elk, grizzly bears, and endangered long-ear bats. All of these negative sub-categories were catalyzed by the original industrial programs established around the complex. It's important to regard the park as a system, which can be inversely mended as it has been disrupted.

ICDPs and Transboundary Partitions

The dilemma is not as simple as ending the harvest of all adjacent natural resources, however; the Northern Cascades have a lot to offer, and it would be ignorant to suggest that humans can simply start doing without natural resources. It is possible to establish a harmonious relationship between environmental preservation and consumption; the key is deep critical analysis and total understanding of the entire area. The current issue is adjacent industry has been allowed to develop without considering the entire system. Adjusting the NCNP boundary to accommodate migratory wildlife, while simultaneously allowing for the continued timber and mining operations would be difficult, but not impossible. New cycling regulations for industrial operations can be established to allow habitats time to recover. New GIS mapping data can be utilized to better identify emergent programs, and to show potential areas of conflict. The most important step to begin improving the Northern Cascades National Park is to get the public involved. ICDPs combined with a hedonic design approach

can catalyze the reformation of the NCNP, within balance and reason for the overall improvement of the entire facility. As stated by the facilitators themselves, “Preservation of the biological diversity and ecosystems in protected areas can be achieved through projects linking conservation of the protected areas with improved standards of living for resident peoples within surrounding buffer zones.” (Service, 2012) ICDP designs have been previously implemented in foreign national parks such as Ranomafana in Madagascar. The challenge will be overcoming those calling for zero development in the park with a perfectly balanced ICDP outline specifically tailored for the Northern Cascades.

Conclusion

In order to create a complete ICDP outline for affected critical habitats, a complete study of the Northern Cascades National Park as a system will be undertaken. This includes, but is not limited to: local industrial operations for natural resources, sub-alpine tree overgrowth/invasion,

and facility underuse. Additionally, detailed inventory on intersecting systems (i.e. hydrology, fauna, air quality) will be collected via ArcMap or other relevant mapping sources. All modalities within the park are intimately connected, and specific typologies will be identified in detail to create the foundation for a site-specific design structure. As these critical aspects are researched, emergent intersecting programs will pinpoint specific sites to illicit design intervention. The Northern Cascades National Park stands upon an important junction, in which facilitators can either stay the course and allow degradation to continue, or open the doors to calculated risks in the interest of elevating the park to even greater heights.

Annotated Bibliography

Agee, J. K., & Kertis, J. (1987). Forest types of the north Cascades National Park Service complex. *Canadian Journal of Botany*, 65(7), 1520-1530.

In this research index based on the journalist's data collection (from both observational and empirical findings), Agee and Kertis present several types of forest zones from around the Northern Cascades. Each zonal category is written about in detail, along with a breakdown of invasive species.

The invasive species portions are most notable.

Experienced botanists, both the authors mention the limitations of their mapping ability, noting that potential or existing invasive species may have been overlooked simply because of their limited resources. Although the article was published in 1987, it is still useful as a lens to make note of how broad forest zones in NCNP have changed over the years.

Bonachela, S. (2010). *Protecting the North Cascades: Environment Washington*.

While this source can't necessarily be cited as professional research, it is still important to the politics behind the park. Bonachela, a seasoned activist and facilitator of the Northern Cascades, sheds light on the U.S. congress' role in the industrial operations and lack of recreational development around the park.

This source is balanced with professional annotation, and cited facts. Bonachela's objective is to get more

people involved in the dealings of the park. He acknowledges the value of pristine wilderness, but insists that development is necessary for the growth and success of an economically viable national park.

Case, M. J., & Peterson, D. L. (2007). Growth-climate relations of lodgepole pine in the North Cascades National Park, Washington. *Northwest Science*, 81(1), 62-75.

In this documentation journal, Case and Peterson set out to identify the reason for the growth success and abundance of lodgepole pines in the North Cascades mountains. The authors' research led them to make a well-detailed system analysis for the park as a whole, making notes of affected sub-alpine meadows and other habitats.

This source is solid, and is a good starting point for an

environmental mapping effort. The focus specifically on the lodgepole pine makes it weaker for the purposes of this paper, but it's still an invaluable asset for the groundwork.

Center, W. G. S. (2015). North Cascades Ecoregion Summary. Retrieved from <http://landcover.trends.usgs.gov/west/eco77Report.html>

This source is simply a collection of USGS data presented in a journal format via google scholar and NDSU electronic texts. It is not presented as a research document.

The most important aspect to notice is the publication date. The data, was compiled and released circa 2015. This information, when combined with older compiled sources, will help provide a clearer idea of how disruptive factors have been altering the park over the years.

Franklin, J. F., Moir, W. H., Douglas, G. W., & Wiberg, C. (1971). Invasion of subalpine meadows by trees in the Cascade Range, Washington and Oregon. *Arctic and Alpine Research*, 215-224.

Although this is the oldest source on the list, it is still important to consider. The 1971 publish date provides important context of early cases of observed invasive species disrupting sub-alpine habitats.

Understandably, the methodology and techniques are a bit weak in this source, but the authors are all decorated professors and environmentalists. The article is primarily observational, which offers a higher degree of intimate detail than data compiled via a mapping collection.

Geographic, N. (2016). *Issues Facing the National Parks*. Retrieved from <http://www.nationalgeographic.com/travel/top-10/national-parks-issues/>

This source was the starting point for many of this paper's arguments. It is a collection of the most

common issues seen throughout all the national parks in the united states.

The writing done for National Geographic ended up being the most frequently cited in-text, mainly because the article describes several different situations in different parks. This is the most recent entry of the set, and has been useful to frame specific issues currently experienced in the NCNP.

Haggard, M., & Gaines, W. L. (2001). Effects of stand-replacement fire and salvage logging on a cavity-nesting bird community in eastern Cascades, Washington.

This source examines several different species of birds with similar migratory patterns and nesting instincts. Forest fires and logging operations have displaced many of these birds, and the authors examine this phenomenon through several different points of observation.

Haggard and Gaines' research is on the cusp of being out of date, but it succeeds in discussing specific wildlife species affected by transboundary upheaval around NCNP. This source is an important inference piece to tie forestry operations to declining critical habitats.

Hemstrom, M. A., & Franklin, J. F. (1982). Fire and other disturbances of the forests in Mount Rainier National Park. *Quaternary research*, 18(1), 32-51.

Hemstrom and Franklin compiled research on different ecologic disturbances afflicting Mount Rainier National Park. Their observations were solid, but seemed to lack any critical analysis. Along with the fact that this article is from 1982 and doesn't add much to the system inventory, it may be removed from any final versions of this paper and archived.

This article is a good supplementary document to the national geographic article on common disturbances,

with more site-specific focus. It serves as a good example for discussing these specific focuses for NCNP.

Mapes, L. V. (2012). The Push Is On to Expand North Cascades National Park: *The Seattle Times*.

Mapes' work is another article primarily dealing with the political aspects behind NCNP. A talented journalist for the *Seattle Times*, Mapes simply reports on advocates seeking to change and expand the borders of NCNP, without providing much of her own analysis.

This article proves that boundary expansion is a viable solution, with meager backing.

Rocheffort, R. M., Little, R. L., Woodward, A., & Peterson, D. L. (1994). Changes in sub-alpine tree distribution in western North America: a review of climatic and other causal factors. *The Holocene*, 4(1), 89-100.

Rocheftort, Woodward, and Peterson, all environmental botanists with published work, add additional vital information to the system collection. Their work provides another time frame to the changing system that is NCNP.

This article does a good job of not only noting sub-alpine changes, but also analyzing why the changes could be occurring.

Service, U. S. N. P. (2012). North Cascades National Park Complex Foundation Document. Retrieved from <https://parkplanning.nps.gov/document>.

CASE STUDIES

The precedent analysis for this design intervention involved identifying projects implemented in national parks that were additive in nature, but did not impede on natural systems of the facilities. Each of these case studies bolster the objectives of Summit's Rally, because they all show the value and potential success of balancing human-set structures with the existing wilderness. The ultimate goal is preservation and improvement.

Fuji-Hakone-Izu National Park

Yamanashi, Shizuoka, Kanagawa Prefectures, Western Tokyo, Japan

Focus Area: created for natural monuments, utilized ICDP to create a balance between visitors and nature (integrated conservation and development project). accomplished this balance by specifying what areas of the land visitors could be on, and how they interact with the zone. the cable car system is the most prolific example of this.

fig. 37-A

Focus Area: transboundary industrial operations mitigated by increased visitor numbers. Swiss National Park is an example of a successful industrial mitigation project. Facilitators acknowledged the necessity for the harvesting of natural resources from unprotected areas around the park, but cited the danger of allowing the operations to continue without any opposition. Measures were taken to attract more visitors over the span of 15 years.

Once visitor numbers were up, the park suddenly had a “voice,” and many were involved in the call for new measures to better facilitate timber operations. The eventual solution was to allow timber and logging work to run on cycles, where deadwood was cut to prevent overgrowth while older sites were allowed to begin regrowth.

Swiss National Park
Western Rhaetian Mountains, Switzerland

Ranomafana National Park

Haute Matsiatra & Vatovavy-Fitovinany, Madagascar

Focus Area: expanded borders to protect endangered migratory species. this remote island is inhabited by a large number of rare and endangered tropical species. nearby industrial operations were displacing and disrupting many of the migration patterns of these animals, and these operations were allowed to continue working without any pushback since ranomafana isn't specifically a tourist park. the eventual solution was to redefine the borders of the facility, based solely on movement patterns of specific migratory species. obviously, animals don't recognize human-established borders, so the lines were redrawn to keep the specified animals protected without completely shutting down adjacent mining and timber operations. currently, measures are also being taken to mitigate natural resource harvesting and similar operations.

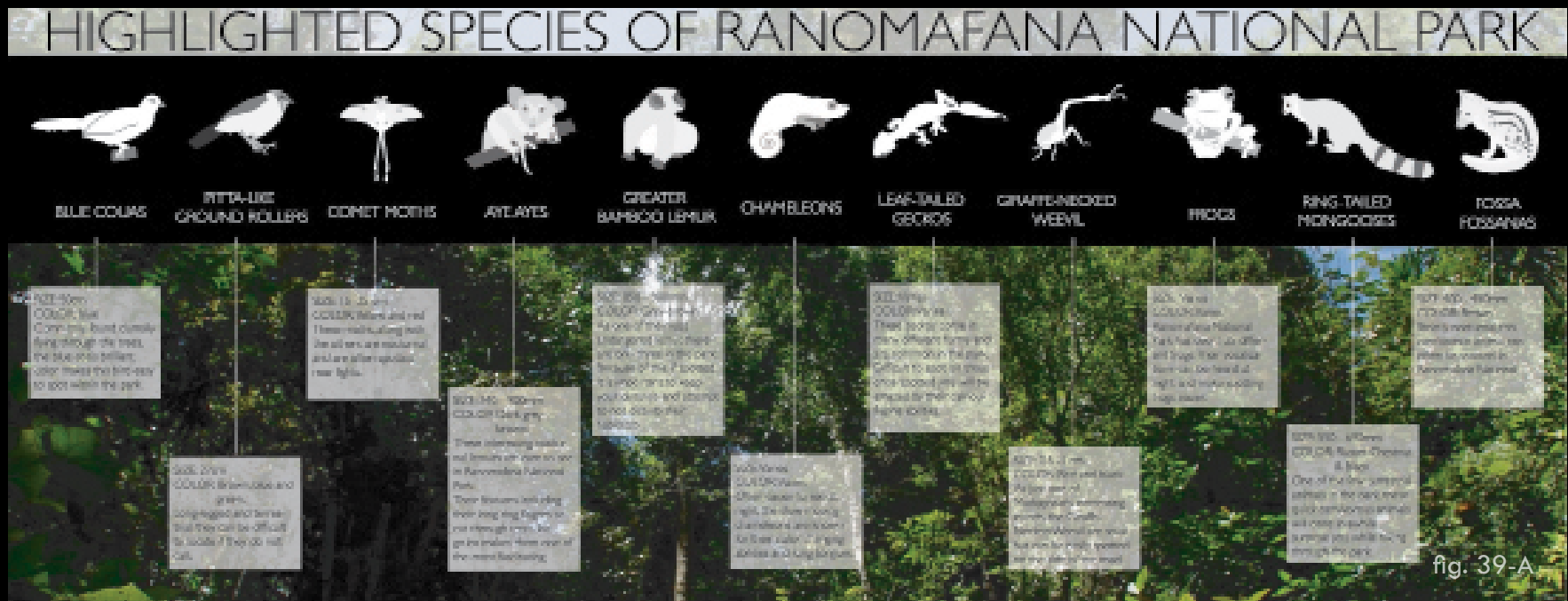


fig. 39-A

As briefly mentioned in the abstract, the bulk of the program elements will be focused around recreation and education to attract visitors with destinations, and at the same time spreading awareness for the state and well being of the park. The current challenge is to set site focus; the actual designed area in the master plan should only need to be approximately 2-3 acres, but space management will be imperative. Programming for this project is generally geared for visitors, but meant to coexist with and improve the state of natural features of the area.

Building Use

Function	People	Capacity	Units	Area/Unit	Net Area	Net Area Subtotal
Visitor Center						
Westhale	11	10	1	1200	1200	
Reception/Displays	1	20	1	2400	2400	
Subtotal	1	60	2	3600	7000	10600
Cable Car Line						
Boose	2	6	1	400	400	
Lines	0	6	1	240	240	
Subtotal	5	10	2	640	640	1680
Observatory						
Office	5	6	1	900	900	
Front Desk	3	6	1	200	200	
Auditorium	6	200	2	2400	4800	
Lobby	0	20	2	1200	2400	
Restrooms	0	25	2	60	120	
Storage Closet	0	6	2	60	120	
Subtotal	14	25	10	4900	8620	13520
Boardwalk+Trail						
Boardwalk	0	60	1	22425	22425	
Trail	0	60	1	22425	22425	
Wayfinding	0	//	12	16	192	
Education Blk	0	//	6	30	180	
Subtotal	4	4	20	46380	46590	92970
Scenic Overlook						
Education Blk	0	15	1	400	7200	
Viewshed	0	15	1	240	2600	
Subtotal	30	30	2	720	10800	11520
Ranger Station						
Living Space	2	3	1	240	1920	
Comm	//	3	1	70	560	
Subtotal	16	16	2	310	2480	2790

fig. 40-A

Land Use

Function	People	Capacity	Units	Area/Unit	Net Area	Net Area Subtotal
Visitor Center						
Westhale	11	10	1	1200	1200	
Reception/Displays	1	20	1	2400	2400	
Subtotal	1	60	2	3600	7000	10600
Cable Car Line						
Boose	2	6	1	400	400	
Lines	0	6	1	240	240	
Subtotal	5	10	2	640	640	1680
Observatory						
Office	5	6	1	900	900	
Front Desk	3	6	1	200	200	
Auditorium	6	200	2	2400	4800	
Lobby	0	20	2	1200	2400	
Restrooms	0	25	2	60	120	
Storage Closet	0	6	2	60	120	
Subtotal	14	25	10	4900	8620	13520
Boardwalk+Trail						
Boardwalk	0	60	1	22425	22425	
Trail	0	60	1	22425	22425	
Wayfinding	0	//	12	16	192	
Education Blk	0	//	6	30	180	
Subtotal	4	4	20	46380	46590	92970
Scenic Overlook						
Education Blk	0	15	1	400	7200	
Viewshed	0	15	1	240	2600	
Subtotal	30	30	2	720	10800	11520
Ranger Station						
Living Space	2	3	1	240	1920	
Comm	//	3	1	70	560	
Subtotal	16	16	2	310	2480	2790

fig. 40-B

Spaces

Function	People	Capacity	Units	Area/Unit	Net Area	Net Area Subtotal
Visitor Center						
Westhale	11	10	1	1200	1200	
Reception/Displays	1	20	1	2400	2400	
Subtotal	1	60	2	3600	7000	10600
Cable Car Line						
Boose	2	6	1	400	400	
Lines	0	6	1	240	240	
Subtotal	5	10	2	640	640	1680
Observatory						
Office	5	6	1	900	900	
Front Desk	3	6	1	200	200	
Auditorium	6	200	2	2400	4800	
Lobby	0	20	2	1200	2400	
Restrooms	0	25	2	60	120	
Storage Closet	0	6	2	60	120	
Subtotal	14	25	10	4900	8620	13520
Boardwalk+Trail						
Boardwalk	0	60	1	22425	22425	
Trail	0	60	1	22425	22425	
Wayfinding	0	//	12	16	192	
Education Blk	0	//	6	30	180	
Subtotal	4	4	20	46380	46590	92970
Scenic Overlook						
Education Blk	0	15	1	400	7200	
Viewshed	0	15	1	240	2600	
Subtotal	30	30	2	720	10800	11520
Ranger Station						
Living Space	2	3	1	240	1920	
Comm	//	3	1	70	560	
Subtotal	16	16	2	310	2480	2790

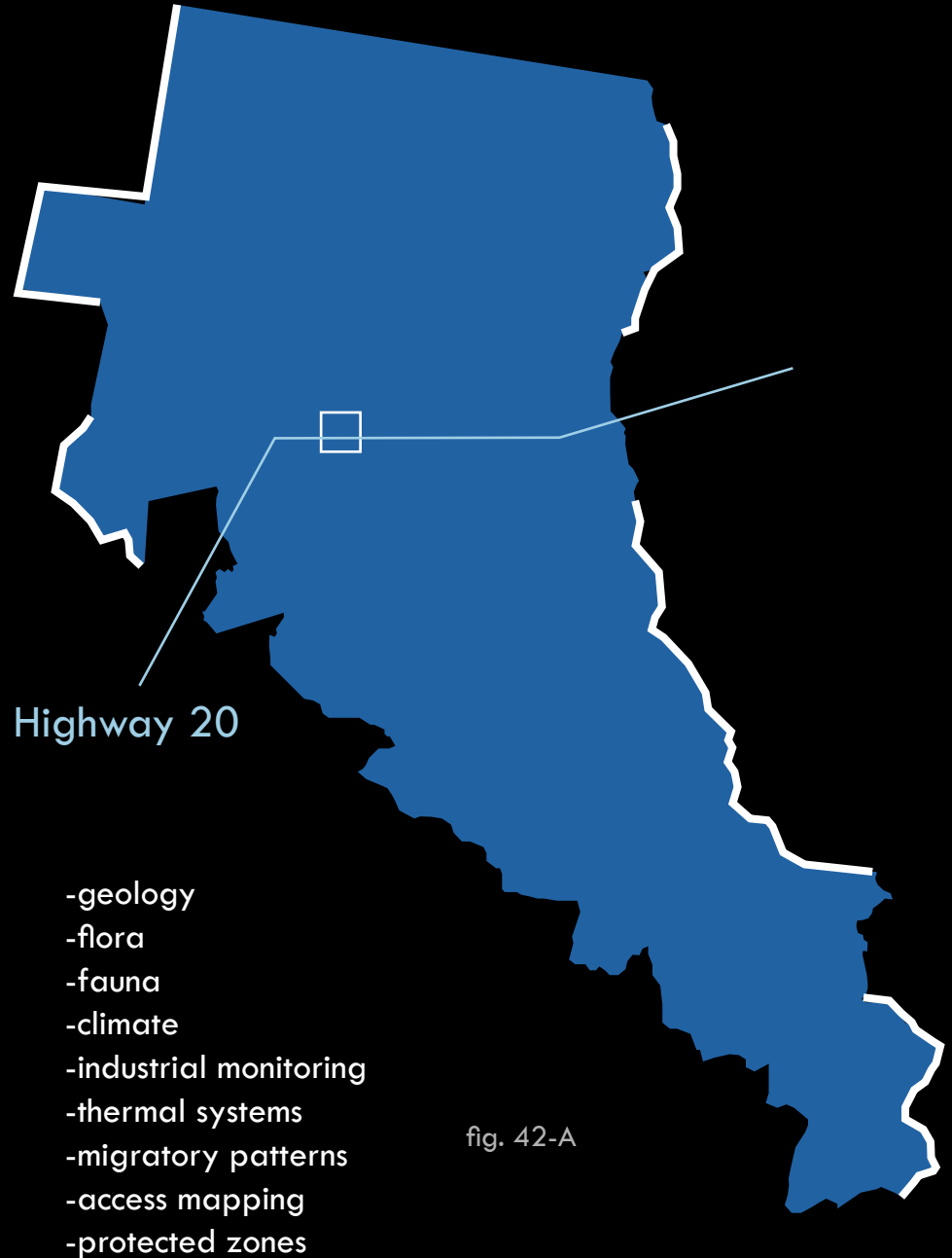
fig. 40-C

Macro Scale: 501,548 Acres Northern Cascades National Park

conclusions

although it is true that adjacent timber, mining, and other industrial operations deal a significantly negative impact upon the park, it would be erroneous to suggest completely removing these operations. the natural resources collected around the park borders are vital and plentiful.

the objective of this project is to determine a cyclical approach where these operations are changing sites annually, allowing for regrowth and recharge. once these parameters have been plotted out, areas for expansion of the park's boundaries will be presented. this is primarily to keep endangered migratory species within the protection of the park.



Meso Scale: 1300 Acres

Action Nodes

Issues Addressed

- erosion
- habitat disturbance
- poor accessability
- shoreline degradation
- endangered species
- zero destination points

Micro Scale: 2 Acres

Project Site

conclusions

the objective of the site design is to strike a balance between structure and nature, and to serve as an educational/exhibition node for the entire park. a well implemented design would bolster support for additional visitor points, which will make identified areas of the park more readily accessible to the public. a newfound identity in the public eye would encourage better regulation for the current industrial disturbances. to summarize, open the park to more tourism without sacrificing the wilderness; which is the only reason Northern Cascades National Park currently exists. endangered species such as grizzly bears, marbled murrelet, and bald eagles will be one of the main focuses for proposed programs. areas >20% slope require special building codes and measures for erosion control.



Proposed & Existing Structures

public access observatory

occupancy type: assembly group a-3, type 5-a 3-story building with sprinkler system
ground floor max height: 15 ft.
ground floor max area: 46,000 square ft.

historic structure rehabilitation

preservation brief 32: site accessibility (ADA compliance)
preservation brief 37: reduction of lead-based paint
preservation brief 41: seismic retrofit

ADA Requirements

S
E
D
O
C

- trail surfaces min. 10" thick
- IBC 1013, IBC 1607; high risk areas require guards min. 42" high for pedestrians
- min. 52" high for bicycles
- max. ramp slope 1:12

Landscape Development

zone use: 15.50.010 governmental development

landscape category: 15.50.040

1. screen-B. includes deciduous and evergreen trees, which will grow a minimum of 6' in two seasons.
2. screen-C. used as a partial separator, generally consisting only of deciduous species, can include interspersed evergreens to create a continuous canopy.

landscape requirements: 15.50.045

1. road frontages: avg. 10' screen-B for development at a min. length.
2. buildings: avg. 10' screen-B for adjacent commercial development.
3. parking lots: avg. 10' screen-C placed along road frontages.

forest practice permits: 15.70.090

class iv: general permit applications shall declare the type, extent, and schedule for future development plans.

class v: timber cycling, to implement reforestation requirements.

performance standards: 11.86.060

1. 70% of development for erosion control
2. 0% surface water discharge
3. class 6 wildlife disturbance prevention standards

site assessment: 11.86.070

1. 36% hazardous/unusable terrain
2. 250' setback from grades >15%

Plan For Proceeding

[to be specified after week 1, as per the research design plan]

SCHEDULE

