Return On Investment in Mat-Su Lands

Economic benefits of trails, parks, and open space

Growing The Valley, Naturally

To make good decisions about the future and to sustain the character of the valley, we need to understand what our lands do for us and how valuable they are to our communities. In addition to typical stresses that come with industrial, commercial, and residential development, rapid population growth in the Mat-Su has placed added pressure on the region's open spaces. This report, *Economic Benefits of Trails, Parks and Open Space in the Mat-Su Borough*, shows that investing in trails, parks and public open space provides significant goods and services with a high return on investment.

Two Birds, One Stone

What can a trail contribute to the economy of the Mat-Su and the health of its residents? Investing in access to outdoor activities attracts visitors that contribute to the local economy through the purchase of goods and services which in turn supports local jobs. Think of it this way: trails create access to salmon streams, which leads to fishing, which requires the purchase of licenses, gear, and services, like food, gas, and lodging, and local guiding businesses.

Walking, hiking and other physical activity helps prevent obesity, type 2 diabetes, and promotes a healthy outlook. Access to public outdoor spaces can decrease stress, aid in mental fatigue recovery, and reduce levels of depression and anxiety. Call it exercise or call it going fishing, the end result is revenue for the valley and healthier living for residents.

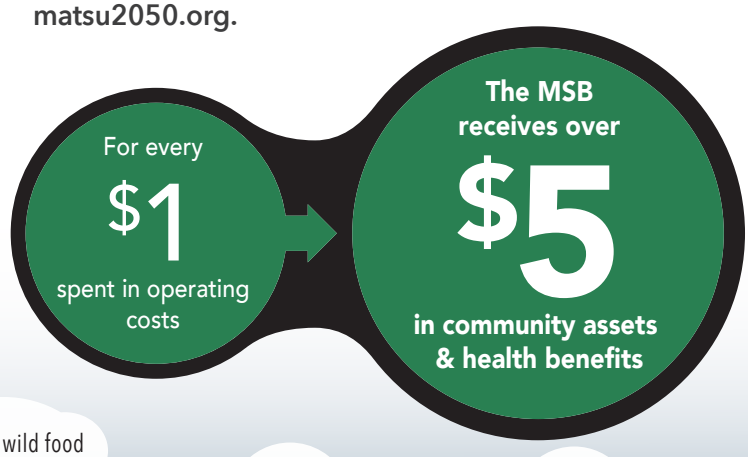
And That's Not All

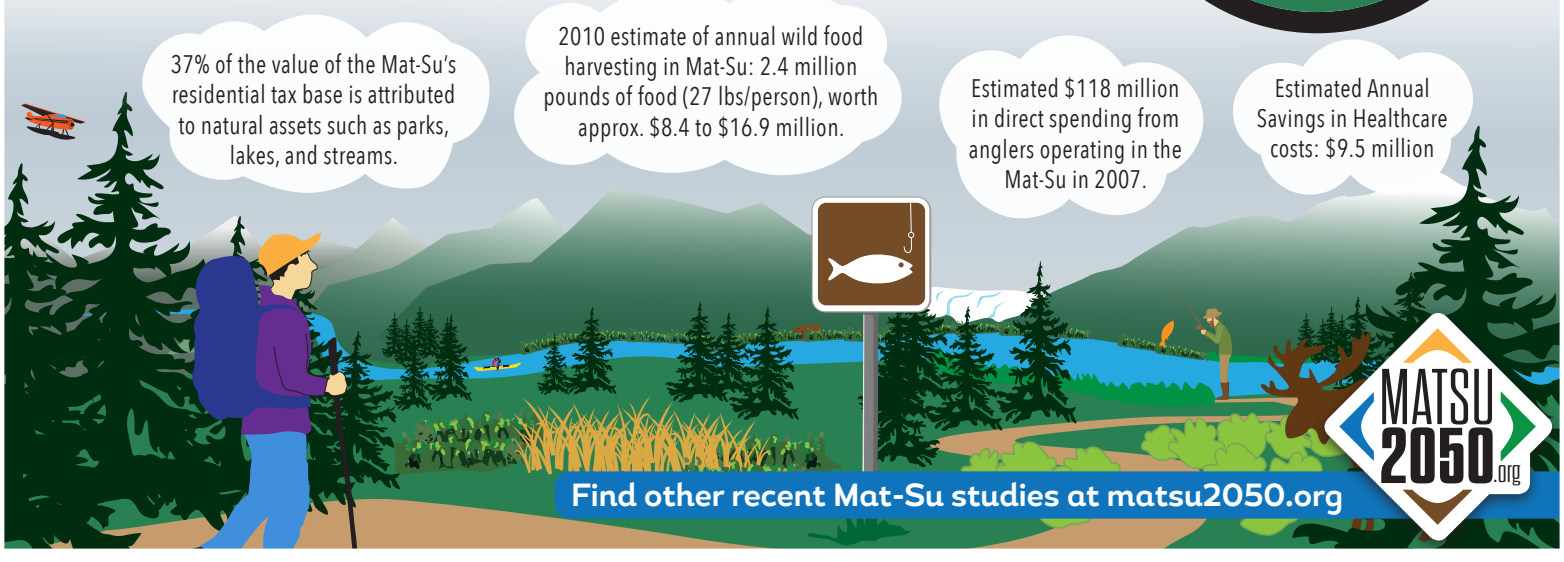
Agriculture and wild food harvests fill the larder of the locals while also adding to health benefits through the gathering as well as the eating. Open spaces such as fields act as fire buffers. Marshes provide flood protection. Proximity to open spaces, streams and lakes increases property values. Visitors attracted to the great outdoors of the Mat-Su stay the night and pay a bed tax. All of these add up to direct and indirect benefits to the Mat-Su Borough.

Healthy, Wealthy & Wise

So, what do we get back from our trails, parks and open spaces for every dollar we put in? This report estimates that when we spend $1 on the trail to that salmon stream, we can look forward to $5 in return. And that's being conservative. It's something to think about the next time funding for trails, parks and public open spaces shows up on the ballot.

Read the complete report at eartheconomics.org or matsu2050.org.





What will the Mat-Su be like in 2050?

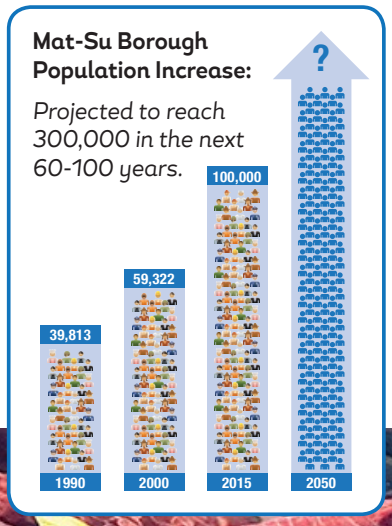
No borough in Alaska has grown at a faster rate in the past 20 years.

Why is everyone moving here?

Here's a hint: it's the character of the valley.

Many people have moved to the Mat-Su for the same reason the native people and later settlers did: the bounty. The first farmers literally carved their fields out of the wilderness. There are no better agricultural lands in the state and the wilderness they "tamed" is 24,000 square miles of natural diversity. Our rivers and streams are home to all five species of salmon. We have healthy populations of moose, caribou, sheep, bear, lynx, wolverine, snowshoe hare, and more. And the lakes and open spaces are pitstops for migratory birds like geese, ducks, cranes, and seabirds.

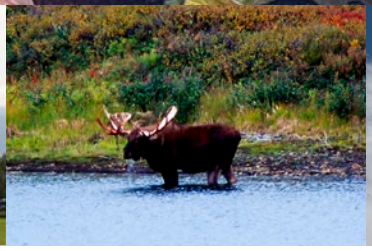
Some people move here because the Mat-Su Borough is one big outdoor playground. Miles upon miles of public land is open to hunting and fishing, hiking, snow machining, rafting, skiing—the list goes on. The glaciers and mountains are spectacular and a magnet for tourists *and* Alaskans.

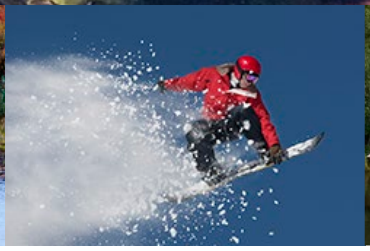


Some people are moving to the Mat-Su because you can still afford a five-acre lot with a house and there are few municipal restrictions. Roughly 30 percent of valley residents commute to Anchorage for work. It's handy and unique to have the economic center of the state 50 minutes in one direction and Matanuska Glacier 50 minutes in the other direction.

These things all make up the character of the valley and they are attracting new residents at a clip. The Mat-Su is the fastest growing area in the state – between 2000 and 2010, the borough population increased by 58%! The forecast is for continued, steady growth. With all the people come their needs: schools, roads, waste and water infrastructure, maintenance services, etc. ***Instead of "What will the Mat-Su be like in 2050?" perhaps we should ask this:***

What do we *want* the Mat-Su to be like in 2050?





What do Mat-Su Residents want? VALUE

How do we evaluate our salmon, farms, ... our freedom?

What is a salmon stream worth?

Or a lake, or a forest, or a view?

Growth spurts are awkward for communities. The Mat-Su Borough is big enough to absorb the crowds, but how and at what cost? We're already struggling to build and pay for schools and roads to accommodate the growing population. From Palmer one can see farmland that has been converted into residential neighborhoods. And many of our traditional trails have either been blocked by recent development or have deteriorated from overuse.

To make good decisions about the future and to sustain the character of the valley, we first need to understand what our lands do for us and how valuable they are to our communities. Farms, fish, trails, open space and clean water provide essential benefits to residents. These are some of our ***community assets*** and need to be considered in land use decisions as the borough grows and changes.

So, what is a community asset worth? That's easier to determine for some assets than it is for others. Sportfishing and commercial salmon industries contribute an estimated 8,056 jobs and $865 million to the local economy*, so the economic value of lands with fish habitat can be partly quantified. 66% of Alaska's agricultural production comes from the valley accounting for 2,000+ jobs and bringing in $55 million annually**, so cultivated lands have a dollar value. But, what is the value of a marsh that acts as flood control and wildfire mitigation? The economic impact of tourism and recreation in the Borough has surpassed that of agriculture. Many of us make our living from sightseeing, flightseeing, lodging for tourists, river guiding, and more. How much is a viewshed worth?

We know the value of raw land shouldn't be considered zero, but how do you put a dollar value on it? Recent studies in the Mat-Su have undertaken to do just that.

*2007 Mat-Su Borough Fish and Wildlife Commission report to the Board of Fish
**www.agcensus.usda.gov/Publications/2007/Online_Highlights/Rankings_of_Market_Value/Alaska/

MATSU 2050.org

Recent Studies in the Mat-Su

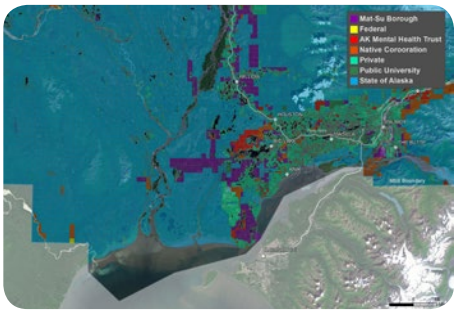
Evaluating our community assets and their impact on our quality of life

Baseline Data

GIS Mapping

Where are the assets?

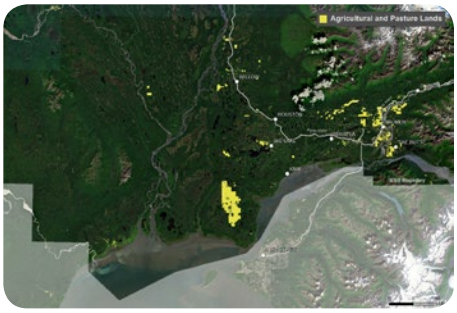
The first step in making informed land use decisions is to know the asset value of different land types. Geographic Information System (GIS) mapping is a computer system that can show data related to physical locations. For example, Great Land Trust, the U.S. Fish and Wildlife Services, and the Mat-Su Borough have worked to prioritize critical habitat for fish and wildlife, wetlands that are essential to regional water quality, and wildlife and recreation corridors. GIS mapping allows us to visualize where these are located in relation to each other and to communities, farms, and neighborhoods. We can analyze them from a 10,000 foot view or zoom in to a specific parcel. This information is essential to gain a better perspective on the benefits provided by different lands across the valley.



MSB Land Ownership

Wetlands

Lakes, Rivers and Streams



Cultivated

More information is available at www.matsu2050.org or www.greatlandtrust.org.

Local Values

Household Values Survey

What do Mat-Su residents value most?

In 2012, UAA's ISER surveyed Mat-Su residents asking what they would like their community to look like in thirty years. Focus groups in Houston, Palmer, Wasilla, Sutton, and Talkeetna helped identify land use issues for the survey. Survey recipients chose between different land use and development scenarios and were given options about how much they were willing to pay for the future they wanted. Results showed that Mat-Su residents want the future to look like the valley they know, or knew – one with fully restored salmon runs, farmland used for...*farming*, and access to recreation areas. It's what brought many of them here in the first place and it's what they'd like for their kids to experience.

Top 3 actions residents would be willing to pay to achieve

More information is available at www.matsu2050.org or iser.uaa.alaska.edu.

MATSU 2050.org

Recent Studies in the Mat-Su

Evaluating our community assets and their impact on our quality of life

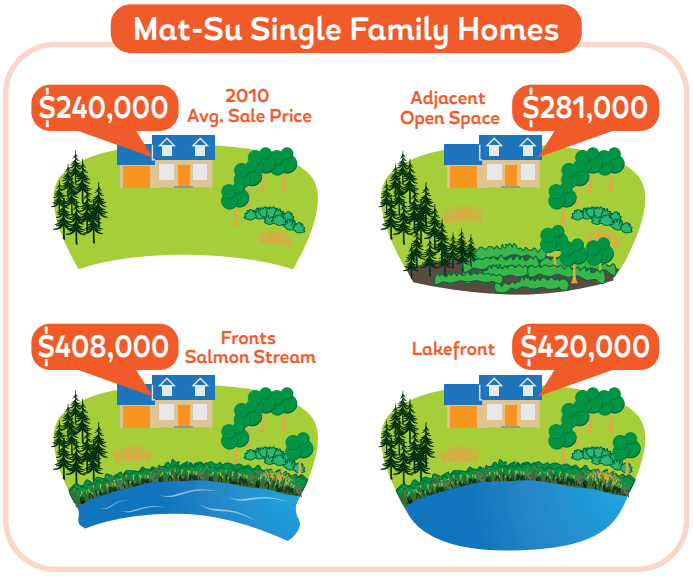
Local Values

Private Property Analysis

Lakes, streams and open spaces

The University of Alaska's Institute of Social and Economic Research (ISER) posed the question: ***do lakes, streams and open space have a positive influence on private property values?*** The short answer is, as you might suspect, yes they do, and the ISER report helps us quantify our assumptions. Bodies of water had the greatest impact: the estimated change in sales value for lakeside property was an increase of 76.4%, for salmon stream frontage it was 69.8%!

On total, the appraised value of residential property and vacant private land was approximately $7 billion in 2011. This report estimates that almost 37% of the total was due to the influence of lakes, streams and open space – that makes Mat-Su lakes, streams and rivers a $2.5 billion community asset!



More information is available at www.matsu2050.org or iser.uaa.alaska.edu.

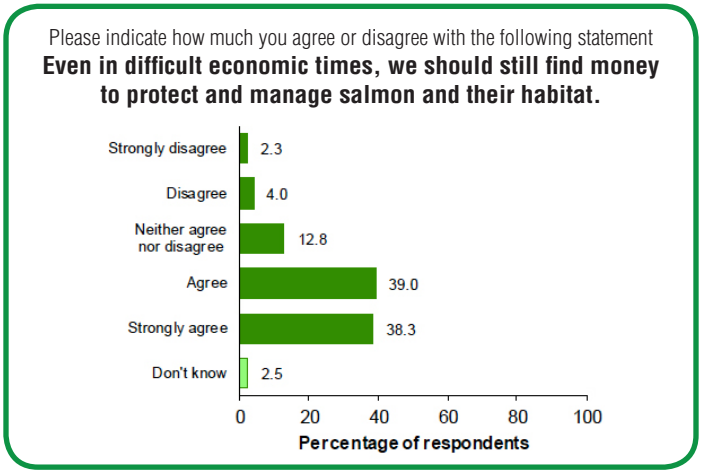
Local Values

MSB Community Survey

Attitudes toward salmon, land use, and the environment

Since 2006, the University of Alaska's Justice Center and the Mat-Su Borough (MSB) have conducted an annual survey of residents about issues like borough revenue and taxation, perceptions of crime, and use of borough services and facilities, for example. In 2014, a new series of questions was added to guage attitudes about salmon, land use and the impact of the environment on our health.

The survey proves out that salmon are highly valued by the community. 82% of respondents agreed that salmon are important to the Mat-Su economy. The results also showed that residents believe salmon are facing long-term problems and they strongly support the protection of healthy salmon habitat. The salmon section, and indeed the whole report, is an interesting and worthwhile read on local values.



▲ *Survey results are given in tables & bar graphs. Respondents were also asked for their comments.* ▼

"I am very concerned about the loss of farm land, fishing and recreational sites, and conservation of water ways in the Mat-Su Valley. My family and I hunt wild meats and prefer them and catch our own fish every year."

More information is available at www.matsu2050.org or justice.uaa.alaska.edu.

MATSU 2050 .org

Recent Studies in the Mat-Su

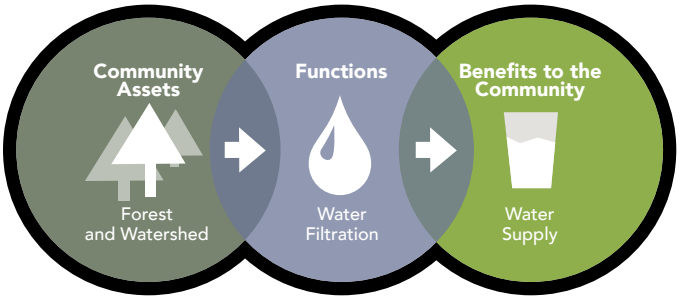
Evaluating our community assets and their impact on our quality of life

Asset Values

Our Natural Economy

It's working for us all the time

This report uses accepted economic assessment tools to valuate the benefits we receive from 13 different land types in the Mat-Su Borough. The study looks at our natural resources as economic assets that benefit our community over–time like bridges and roads. For example, wetlands are nurseries for salmon, which provide a tangible boost to our economy. Wetlands also help us avoid costs because they act as sponges to moderate potential flooding, function as "free" waste treatment, and are part of our water supply system. Not only do we sit back and reap the benefits, assets like these are self-maintaining and, when managed sustainably, have longer lifespans than man-made infrastructure. Consider the cost to build, maintain, and ultimately replace, a water-



filtration plant as a substitute for naturally filtered groundwater. It's substantial and this example is just one benefit from one land type.

What's it all worth? approximately $35 billion of direct inputs (e.g. salmon) plus avoided costs (e.g. water treatment facilities) to our economy each year, or an estimated $1 trillion over 100 years. When these asset values are considered in land-use decisions by governments, private owners, and organizations, we all benefit.

More information is available at www.matsu2050.org or www.eartheconomics.org.

ROI Analysis

Return On Investment

Economic benefits of trails, parks, and open space

What can a trail contribute to the economy of the Mat-Su? Think of it this way: trails lead to salmon streams, which leads to fishing, which requires the purchase of gear, and services, like food, gas, and lodging, and local guiding businesses. Call it exercise or call it going fishing, the end result is revenue for the valley and healthier living for residents.

And that's not all. Proximity to open spaces, streams and lakes increases property values. Agriculture and wild food harvests fill the larder of the locals while also adding to health benefits through the gathering as well as the eating. Fields act as fire buffers. Marshes provide flood protection. Visitors attracted to the great outdoors of the Mat-Su stay

the night and pay a bed tax. All of these add up to direct and indirect benefits to the Mat-Su Borough.

This report quantifies what we get back from our trails, parks and open spaces for every dollar we put in. In simple terms, when we spend $1 on the trail to that salmon stream, we can look forward to $5 in return. And that's being conservative. It's something to think about the next time funding for trails, parks and public open spaces shows up on the ballot.

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MATSU 2050.org

A RETURN ON INVESTMENT ANALYSIS

ECONOMIC BENEFITS OF TRAILS, PARKS, AND OPEN SPACE IN THE MAT-SU BOROUGH

EARTH ECONOMICS

Economic Benefits of Trails, Parks, and Open Space in the Mat-Su Borough

REPORT VERSION 1.0

DATE

December 11, 2015

AUTHORS

Maya Kocian

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The Earth Economics team members who contributed to this report include Jessica Hanson, Lola Flores, Nathan Cutler, Aaron Schwartz, Peter Casey, and Gwenael Podesta.

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The author is fully responsible for the content of this report.

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ABSTRACT

Community assets such as trails, parks and public open space provide numerous benefits of both economic and social value. These assets provide recreational opportunities for residents, helping people to stay healthy and happy as access to spaces for exercise increases physical activity and reduces medical expenses. Recreation also stimulates the economy through the purchase of gear for activities, services and guided tours. This economic activity creates jobs in recreational sales, the hotel industry, tourism, and more. Public spaces enable all of these benefits to happen. Without access to trails, parks and open space, these benefits would be greatly diminished. This report summarizes the return on investment for these community assets in the Matanuska-Susitna (Mat-Su) Basin of south-central Alaska. Both social and economic benefits are covered in this report. Social benefits encompass recreation, tourism, human health, public safety, subsistence, and cultural and historical benefits. Economic benefits include those from businesses, tax revenues, and taxpayer savings.

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EXECUTIVE SUMMARY

Investing in public open spaces is a wise choice for the people of the Matanuska-Susitna (Mat-Su) Basin. This report finds that for every $1 spent on public open space in the Mat-Su, there is a $5.31 return on investment. Not only is investment in open spaces a fiscally responsible decision; it is also necessary for the survival of ecosystems and all of the Alaskan communities they support.

In 2013, Earth Economics conducted a study of the value of the natural assets, also called natural capital, of the Mat-Su. The study used an analysis of land cover types to identify ecosystem services that natural assets provide, such as water supply, raw materials, and recreational value. In all, the natural assets of the Mat-Su totaled at least $20 billion in annual benefits to the regional economy.

At the same time the ecosystem services study was commissioned, there was a desire from the public for more specific information about the value of public open spaces from the perspective of local people. A 2014 survey revealed that residents prioritize, in order: 1) protecting and restoring healthy salmon runs, 2) retaining and conserving farmland, and 3) expanding access to non-motorized recreation.[1] All three priorities reflect the importance that residents place on protecting the integrity of the lands where their communities are located.

This report, *Economic Benefits of Trails, Parks and Open Space in the Mat-Su Borough*, is the first comprehensive return on investment analysis of the Mat-Su's open space that includes natural capital and health benefits. Using novel techniques and case studies for calculating value and rates of return on investment in natural capital, this report shows that *investing in trails, parks and public open space provides significant goods and services with a high return on investment.*

INTRODUCTION

The Matanuska-Susitna (Mat-Su) region is a diverse and majestic landscape located north of Alaska's largest city and surrounded on all sides by massive mountain ranges, including the renowned Alaska Range. At 24,300 square miles, the Mat-Su contains dense forests, mountain glaciers, rivers full of salmon, and some of the best agricultural land in the state. It is also the fastest growing region of the state, having increased by at least 49.5% each decade beginning with a population of 6,509 in 1970 up to almost 100,000 today.[2]

There are several sectors of the economy that are directly dependent upon healthy open spaces, and there are many other instances where such spaces indirectly impact economic and social well-being. Supporting anything from the Mat-Su's robust tourism industry to the savings of reduced healthcare costs, public open spaces are a crucial component of life and productivity in south-central Alaska. This report specifically examines the benefits to tourism, health, public safety, agriculture, and tax implications of public open spaces.

In addition to the typical stresses that come with industrial, commercial, and residential development, rapid population growth in the Mat-Su places added pressure on the region's open spaces. Since the turn of the century, high migration rates into the Mat-Su have drastically changed the interplay between people and the physical environment. This study is intended to assist residents, communities and local governments as they face the challenges of population growth and land use development in the Mat-Su.

IMPORTANT DEFINITIONS

For the purposes of this paper, there are several terms that should be understood to have a specific definition:

- **Public open spaces** refer to parks, trails, and other non-privately owned areas.
- **Natural capital** refers to stocks of natural assets including land, air, water, and all living things.[3]
- **Ecosystem goods and services** are the flow of benefits that people receive from natural capital.

CHAPTER 1

TOURISM AND THE OUTDOOR RECREATION INDUSTRY

Rich with beautiful landscapes and diverse natural spaces, the Mat-Su Borough provides ample resources to fuel the tourism industry. Tourism is a significant contributor to the region's economy because the Mat-Su offers numerous free or low-cost outdoor activities that appeal to a variety of users. Fishing, hiking, and hunting are just a few examples of activities that draw year-round visitors who contribute to the local economy. In 2013, the leisure and hospitality sector alone accounted for 9.3% of all jobs in the Borough.[4]

One 2008 study estimated that **roughly 780,000 visitors spend $201.1 million per year in the Mat-Su Borough and support nearly 3,100 jobs**.[5] Both in- and out-of-state visitors support the local economy through food and lodging-related expenditures, recreational expenses, and more.[6] Table 1 shows the distribution of these direct expenditures between in- and out-of-state visitors. Overall, direct expenditures from tourism have a significant impact on the Mat-Su economy. Spending on food and accommodations alone accounts for over half of this revenue, bringing income to restaurants and hotels and providing jobs throughout the community.

TABLE 1 ESTIMATED ANNUAL VISITOR EXPENDITURES, MAT-SU BOROUGH, 2008[7]

OUT-OF-STATE VS IN-STATE VISITORS	US DOLLARS
Out-of-State Visitors	$ 79.8 million
In-State Visitors	$121.3 million
TOTAL TOURISM INDUSTRY SPENDING	$201.1 million

Indirect and induced revenues from tourism also impact the Mat-Su economy. Indirect revenue is generated through intermediate sales made from industry to industry within the supply chain. For example, a grocery store that buys produce grown in the Mat-Su creates an indirect contribution to the economy. Induced revenue, on the other hand, is generated when workers spend their wages in local businesses.

Table 2 illustrates the total impact of all direct, indirect, and induced visitor-related spending. Taken as a whole, these three spending areas provide nearly 4,000 jobs and $282 million each year as a result of tourism. The Mat-Su is also expected to see an increase to about 1,200,000 visitors annually by 2017.[8] This increase will most likely lead to more tourism-related jobs and revenue for businesses.

TABLE 2 ESTIMATED IMPACTS OF TOTAL DIRECT, INDIRECT AND INDUCED VISITOR-RELATED SPENDING, MAT-SU BOROUGH, 2006-2007[9]

	DIRECT	INDIRECT	INDUCED	TOTAL
Employment	3,100	390	430	3,920
Labor Income	$78 million	$12 million	$13 million	$103 million
Output (spending)	$201 million	$38 million	$43 million	$282 million

While in the Mat-Su, visitors engage in a variety of activities, several of which generate additional revenue for the region. Outdoor activities such as wildlife watching, hiking, camping, and fishing are some of the strongest draws for visitors. Hikers can explore 2,117 miles of trail within the Mat-Su, and anglers can fish for the renowned King salmon in the Borough's numerous rivers and streams. Fishing is one activity that generates substantial revenue for the Mat-Su economy. In 2013 alone, 227,000 fishing licenses and 55,000 King salmon stamps (required for fishing King salmon) were issued in south-central Alaska, generating $9.6 million for the Alaska Department of Fish and Game. The market for hunting is smaller; however, the 51,500 licenses sold still generated almost $2 million in revenue.[10]

In addition to the license revenue that goes to the state, the economic impact of recreational fishing can be seen on a local scale. Sport fishing represents a huge portion of total tourism-related revenue, with an estimated $118 million in direct spending from anglers operating in the Mat-Su during 2007.[11] This figure represents the middle estimate of expenditures for guides, equipment, food, lodging, and other associated costs. For the same year, sport fishing also contributed to 1,180 jobs and over $40 million of income for residents.[12]

CULTURAL AND HISTORICAL VALUE

The cultural and historical value of public open spaces is an aspect that is frequently overlooked, yet the Mat-Su hosts a wealth of this type of resource. The Borough boasts many units of the national, state, and local park systems, as well as spaces marking important sites or historical periods such as the Independence Mine Historical Park and the Iditarod National Historical Trail.

The Iditarod National Historical Trail runs through the heart of the Mat-Su Basin and is possibly the greatest example of the rich cultural and historical heritage of the area. This 1,000-mile historic route is well known for the sled dog races that take place along its course; however, the trail originally served as a trading route for Alaska natives in past centuries. Both the annual race and various stretches of the historic trail continue to contribute to the rich cultural legacy of Alaska and attract tourists, hikers, and backpackers.

ECONOMIC IMPACT

The input of local and out-of-state visitors to the Mat-Su is incredibly valuable. Resident population growth has been followed by an increase in the number of both in-state and out-of-state visitors. A 2008 study predicted an increase in visitors of more than 50% by 2017 and encouraged investment in the recreational trail system in order to attract outdoor-enthusiast travelers.[13] The return on this type of investment is significant: a $300,000 to $500,000 annual investment in trails enhancement was estimated to spur spending of up to $2 million to $3.9 million annually.[14] With strategic investments, the Mat-Su will not only continue to exert itself as a must-stop destination for cruise-package passengers and independent travelers who want to experience a piece of Alaska's natural wonder, but it may also see new untapped economic gains for residents.

The protection of the Mat-Su's valuable open space for tourism and recreation also results in a great deal of co-benefits that arise from the natural capital of those open spaces. When land is conserved, so too are all of the community assets derived from the land, which in turn magnifies the return on investment in land protection. The value of this investment is analyzed in Chapter 5.

CHAPTER 2

HEALTH

In this chapter, we estimate the economic benefits related to physical activity provided by the Borough's public open spaces as they are today. Outdoor physical activity reduces the occurrence of diseases and obesity, increases productivity, and improves mental well-being. Public open spaces are key elements for the Mat-Su residents' health and quality of life. Enhancing access or creating new parks could even potentially increase indirect benefits.[15]

As in the rest of the country, physical inactivity is a concern in Alaska. One out of every three children in the state is obese or overweight.[16] In 2013, the estimated total health-related costs associated with obesity and overweightness in children, adults, and seniors in Alaska was $276 million.[17] If the current trend continues, these costs are expected to increase to $680 million per year by 2018.[18]

The Borough ranks well compared with other counties around the country and has met the national Healthy People 2020 goals in exercise and obesity. However, there is still room for improvement, especially among adults and seniors. Only 39% of adults and 27% of seniors in the Mat-Su are considered to be at a healthy weight.[19]

THE IMPACT OF PARK ACCESS ON HEALTH CARE COSTS

Increased access to parks and trails can help a community meet health goals and reduce medical costs. People living close to public open spaces are more likely to participate in outdoor activities.[20] Physical exercise can reduce the likelihood of acquiring illnesses such as diabetes or arthritis, and, consequently, it can also reduce the associated medical costs.[21] The Mat-Su Borough offers a wealth of outdoor resources that can translate into economic benefits in the form of health savings for residents.

The physical benefits of open spaces are well documented. It is well established that increased access to public outdoor spaces encourages people to exercise more, reducing overall healthcare expenditures.[22] A 2002 study demonstrated that the "creation of or enhanced access to places for physical activity combined with informational outreach produced a 48.4% increase in the frequency of physical activity."[23] The American Journal of Preventative Medicine, as cited by the Trust for Public Lands, quantified an average reduction of $2,200 per person for annual health care costs among those who were able to change from a sedentary to an active lifestyle.[24] Investment in publicly accessible open space encourages behavioral changes that not only reduce obesity and health care costs, but also improve quality of life.[25]

In addition to physical benefits, research indicates that people who have increased exposure to the outdoors show long-term mental health improvements. Several studies have demonstrated that access to public outdoor spaces can decrease stress, aid in mental fatigue recovery, and reduce levels of depression and anxiety.[26]

Exposure to rural or more forested areas provides further benefits. Researchers have found that when compared to walks in urban areas, leisurely forest walks lead to a 12.4% decrease in the stress hormone cortisol.[27] A 2014 study from the University of Michigan found that walking in natural areas is linked to lower depression and perceived stress.[28] In fact, the presence of a nearby urban park can result in the same mental health benefits to a community as a 2% decrease in unemployment.[29]

Public outdoor spaces also provide important benefits to children and childhood development.[30] Research has shown that child's play, playgrounds, and parks are linked to positive development of neural pathways for motor-skills, social skills, cognitive learning, imagination, language, and expression. Outdoor play creates opportunities for children to establish boundaries, negotiate compromises, cooperate, and learn self-control.[31] Parks can also provide additional benefits to children with developmental disorders. For example, one study on the effects of outdoor time on children with ADHD found that a 20-minute walk in the park improves concentration just as effectively as common prescription medications.[32] Similarly, other studies have shown that low access to nature leads to higher rates of ADHD and other mental disorders.[33]

The Mat-Su Community Health Needs Assessment[34] found that Borough residents are demanding more open spaces and exercise opportunities. When asked what they would change to improve their overall health, respondents answered more exercise and/or recreation (19%), healthier food (15%), and better health insurance (5%). Respondents also said the healthiest aspects of living in the Mat-Su Borough are a clean environment (18%), wilderness/nature (13%), and exercise opportunities (10%).

ECONOMIC VALUE OF HEALTH BENEFITS PROVIDED BY OPEN SPACE

The Mat-Su Borough's public outdoor spaces benefit residents by providing them with a place to exercise, helping to improve their overall health, and lowering medical spending. We can conservatively estimate these benefits in economic terms.

We use a similar methodology to the Round Rock City Parks and Recreation Department in Texas, which estimated the benefits to locals visiting parks for exercise, while excluding those who also use health clubs.[35] Our valuation also relied on a physical inactivity health calculator developed by Chenoweth and Bortz,[36] which drew from seven state-wide studies.

In order to determine the medical savings due to public outdoor spaces in the Mat-Su Borough, we estimated the number of people living in urban areas[i] of the Borough who utilize parks to meet the physical activity recommendations of the U.S. Centers for Disease Control and Prevention (CDC).[ii] The CDC recommends 30 minutes of moderate exercise five times a week or 20 minutes of vigorous exercise at least three times a week for adults. Once we had estimated the total number of residents who met the requirements, we isolated the residents that exercise just on trails using percentages from a community survey, so that indoor recreation facilities such as swimming pools and ice rinks were not included.[37]

The resulting figure was multiplied by the cost savings per individual due to increased physical activity. The total cost savings included the following:

1. Total health cost expenditures taking into account the cost of medical care
2. Total health cost expenditures taking into account the loss of productivity (indirect costs) due to absenteeism (not working due to health issues) or presenteeism (the proportion of the work load an employee is unable to do due to their compromised health status).

Finally, since medical costs can vary across the country, and Alaska yields average medical costs 33% higher than average national costs, a multiplier (1.33) was used to compensate for the Borough's increased medical costs.[38]

For children and teenagers, the healthcare cost estimate was made by referencing studies that examine the consequences of obesity.[39] Other conditions linked with inactivity such as high cholesterol or high blood pressure were not taken into account, as they are uncommon among children. The proportion of children and teenagers who exercise in parks and trails was divided by two, assuming only half exercise in public outdoor spaces and not in school. However, this number is likely to be an underestimate as eight percent of high school students attend sport classes.[40] Finally, considering that physical activity is only one cause of obesity among others (genetics, diet, psychological environment), but one of the most important,[41] a conservative 40% multiplier was applied.

i Urban areas are defined as areas with a mixture of constructed materials and vegetation. Impervious surfaces account for 50% to 79% of the total cover. These areas most commonly include single-family housing units, apartment complexes, row houses and commercial/industrial.

ii CDC national database- Public health data and statistics http://www.cdc.gov/physicalactivity/data/

Based on these calculations, the estimated average value in medical savings for adults who exercise in public outdoor spaces is $288 per year. This value is consistent with the estimated cost related to obesity in Alaska divided by the population. For the senior population, the healthcare cost was doubled compared to adults ($576), but no loss of productivity was taken into account since they are less likely to work. For children, the estimated average value in medical savings is $127 per year.

The table below demonstrates that even with the conservative assumptions that have been made, public outdoor spaces are very important in terms of health, and the physical activity that takes place in these areas is worth millions of dollars annually.

TABLE 3 ANNUAL SAVINGS IN HEALTH CARE COSTS AND IN LOST PRODUCTIVITY

	CHILDREN (0-17 YEARS)		ADULTS (18-64 YEARS)		SENIORS (65+ YEARS)	
	%	VALUE	%	VALUE	%	VALUE
Population in the borough	27.70%*	26,368	63.20%*	60,161	9.10%*	8,662
Urban population[42]	50.00%*	13,184	50.00%*	30,081	50.00%*	4,331
Number who meet CDC daily activity requirements[43]	20.90%†	2,755	57.90%†	17,417	57.90% †	2,508
Number who exercise in parks and trails[44] [45]	15.00%*	413	15.00%*	2,613	15.00%*	376
Number who exercise at Mat-Su parks/trails	65.40%*	270	65.40%*	1,709	65.40%	246
Cost saving per individual - Healthcare[46]	$127.18†		$288.00†		$576.00†	
Multiplier for AK Cost saving per individual – health care 19	133.90%†	$170.29	133.90%†	$385.60	133.90%†	$771.30
Total annual savings related to health care		**$46,048**		**$658,859**		**$189,735**
Labor Force	0%†	0	80.00%†	5392	22.00%†	214
Unemployment	0%*	0	9.00%*	4907	9.00%*	194
Cost saving per individual – Lost productivity 25		-		$1,186†		$1,186†
Total annual savings related to lost productivity		**-**		**$2,255,066**		**$88,922**
TOTAL COMBINED ANNUAL SAVINGS		**$46,048**		**$2,913,925**		**$278,657**

Scale of the data: ° USA † Alaska * Mat-Su Borough

TOTAL POPULATION
95,192

ANNUAL HEALTH CARE SAVINGS ACROSS ALL GROUPS
$894,641

TOTAL SAVINGS ACROSS ALL GROUPS
$3,238,630

Our economic analysis focuses solely on outdoor physical activity, but public outdoor spaces can also improve the overall health of the population by purifying air and filtering particulate matter. Air pollutants have a direct impact on health.[47] In addition, exposure to neighborhood green spaces has been linked to recovery from mental fatigue, stress reduction, and lower levels of symptoms for depression and anxiety.[48] The economic benefits from these mental health issues have not been calculated in this study; therefore, the total economic value of public outdoor spaces in the Borough could potentially be significantly higher.

Our analysis also focused on the urban population as their physical activity habits are well documented. For rural populations, however, data is scarce,[49] so this population was not included in this study. However, despite its rapid development, the Mat-Su Borough remains largely rural compared to other regions of the US. The next step could involve estimating the benefits of public outdoor spaces for this understudied population, especially because rural communities are more likely to be inactive.[50] The general assumption is often that people are more likely to engage in physical activity when they live close to green spaces, but even in rural areas, access to public outdoor spaces may be limited. This issue could be addressed by improving trails accessibility, preserving walkable streets, and engaging with the public to encourage outdoor recreation.

ECONOMIC IMPACT

The reduced healthcare expenses that result from promoting an active community that takes advantage of its great natural resources has an immediate impact on the wallets of Mat-Su residents. Even small investments in trails enhancement and recreation outreach programs can pay off as the likelihood of healthcare expenses to treat conditions associated with lack of activity decreases. The return on investment analysis in Chapter 5 quantifies this economic factor along with the value of ecosystem services from conserved public open spaces.

CHAPTER 3

PUBLIC SAFETY

Floods, fires, and other natural disasters can disrupt communities and local economies, causing significant expenditures for mitigation and repair, but open space can offer an important buffer against these types of disturbances. By preserving open spaces in strategic locations and pursuing development within the limitations of these buffer zones, the negative social and economic impacts of storms, floods, wildfires, and other natural disasters can be weakened.

Throughout this chapter, **buffer zones** refer to public open spaces that serve a functional role due to their location in protecting developed infrastructure from damage sustained during natural weather events.

FLOOD PREVENTION

Ecosystems such as wetlands and forests can help reduce the risk of flooding and landslides. Natural capital such as headwater forests, wetlands and aquifers provide critical water regulation and storage that reduces flood peaks and duration. When natural capital in a watershed is degraded or converted, however, the land's capacity to absorb disturbances is reduced. Surface water runoff increases and flows into streams and rivers more quickly, contributing to higher peak flows, more frequent flood events, and increased instances of erosion and landslides.

The Mat-Su Borough has certainly experienced the impacts of flooding. In September 2012, the Little Susitna River and its tributaries flooded due to a weeklong rainstorm that pushed water levels over their banks. Flood advisories were issued, and communities were severely impacted. In one incident, ten people were rescued in a flash flood in Wasilla after a creek overflowed on September 20, 2012.[51] Residents near the Talkeetna River reported that it was the worst flooding they had seen in thirty years.[52] According to bulletins from the Matanuska-Susitna Borough, more than 60 roads were disrupted, 14 homes were destroyed, and 823 other structures were damaged due to the flooding. Repairs to the Borough's infrastructure were estimated at $10 million. Clearly, the impacts of flooding have significant effects on the local economy.

Healthy ecosystems can help monitor and ease flood impacts. Healthy riparian buffers are particularly effective in preventing erosion, avoiding water quality degradation, and reducing overall flood damage. Landscape complexity also plays an important role in disturbance prevention. For example, historical river systems were comprised of many channels and floodplains that were regularly inundated with water. This dispersion of water helped to spread the impact of flooding and slow currents.

Currently, there are several hundred thousand acres of open space near rivers within the Mat-Su. If a portion of these acres are maintained as trails and parks, they can continue to provide both recreation and flood risk reduction value.

FIRE PROTECTION

Natural wildland fire is a vital process throughout the forests and tundra of Alaska. Fire regenerates and diversifies landscapes by freeing seeds from their cones, opening space for new growth, and allowing sunlight to reach the forest floor. For millennia, ecosystems like Alaska's boreal forests have depended on the natural disturbance that fire offers. Usually, these fires start when dry vegetation is ignited by a lightning strike; however human-caused ignition events are increasingly to blame for devastating fires close to Alaskan communities. As populations grow and spread throughout the landscape, the interface of humans and wilderness will continue to be a large source of fires.

The 2015 fire season began in a hurry after an unusually dry early spring led into a record-hot May and June, turning forests into huge stores of burnable fuel.[53,54] As of July 14th, a total of 769 fires had burned 5.1 million acres statewide, including 104 fires and well over 7000 acres in the Mat-Su Borough alone.[55] However, 2015 has not been the only intense fire season in recent years. The area burned in the state from 2000 to 2009 was more than twice that of any previous decade, and the average annual acreage burned is expected to double again by 2050.[56] Headlines describing fires as "historic" and "unprecedented" may not be viewed as anomalies moving forward, but instead perhaps the new normal.

When looking towards the prosperous Mat-Su of the future, risks to people, property, and vital resources need to be examined. The immense size of the region can cause difficulties when planning for and responding to fires, but it can also be beneficial. Open space buffers people and property from potentially destructive blazes, and these areas can be categorized in order to most effectively plan for and react to fires. The Alaska Interagency Wildland Fire Management Plan (AIWFMP) outlines four distinct strategies for fire treatment depending on the fire's proximity to communities and vital resources.[57]

The AIWFMP identifies four types of fire zones: densely populated zones deemed *critical*; less populated areas that still contain important resources or properties called *full* zones; more remote areas known as *modified*; and, finally, the most isolated zones called *limited*.[58] In *critical* zones, where fires are immediately and aggressively suppressed in order to protect public safety, mechanical thinning and clearing of trees can be utilized as a preemptive tactic to limit risk. On the other end of the spectrum, the *limited* zones far from communities or infrastructure may be allowed to burn and spread naturally in order to promote the ecological processes of healthy forests and the ecosystem services that people receive from them, such as water filtration, erosion control, and protection from the larger, more intense and less controllable fires that occur when fuel loads build up over time. Additionally, allowing *limited* zone fires to run their natural course provides the benefit of avoiding suppression costs, which are extremely expensive in such hard to reach regions.

Much of the Mat-Su Borough is categorized as *full* or *modified* zones where agencies have the opportunity to manage fires in a way that will enhance the resource and land-use benefits they provide.[59] These zones represent the crucial buffers where sound fire management before and during fires will have the most impact. Strategies that limit the likelihood and scope of dangerous and costly fires later on, such as fuel load reduction and the use of prescribed fires, can be practiced in these buffer zones to provide the most risk mitigation value. In order to maximize the value of these areas when they are not being actively used for fire management, the buffers can be protected as open space for parks, trails, hunting and fishing grounds, and other uses that retain benefits of recreational space, as described in Chapters 1 and 2.

ECONOMIC IMPACT

Buffer zones provide invaluable resilience to natural hazards such as floods and wildfires while simultaneously providing water filtration, flood control, storm resilience, and a host of other community assets that support human health and development. This network of co-benefits means that the relatively low investment of protecting public open space results in economic returns as well as providing a buffer against frequent storm and natural disasters. A high risk mitigation capacity also means that the community is likely to suffer fewer losses of businesses and jobs during natural hazards, and that the local economy can respond faster to the issues that do arise.

CHAPTER 4

AGRICULTURE AND WILD FOOD HARVESTING

Agricultural land is a major component of open spaces in the Mat-Su Borough. Home to the most productive agricultural lands in Alaska, the Mat-Su has 19,256 acres[60] of farmland that collectively produce more than half of the total value of the agricultural production of the state on only 2.3% of the land used for crops.[61] The value of crops grown in this area is estimated at more than $15 million.[62] There is a small dairy industry, and several family farms in the Mat-Su take advantage of the climate by specializing in crops that do well in cold soils with a short but intense growing season, such as potatoes, peas or carrots. The majority of these farms are small family farms producing high-value crops thanks to good irrigation systems and long daylight hours. The farms are mostly clustered around Palmer and the Point Mackenzie area.

Table 4 presents agricultural data from the 2012 Census from the United States Department of Agriculture. The "Region of Anchorage" is the smallest unit in the US agricultural census and it includes both the Mat-Su Borough and the Municipality of Anchorage, which has limited farming.

TABLE 4 AGRICULTURAL DATA OF THE REGION OF ANCHORAGE (INCLUDING MAT-SU) COMPARED TO THE REST OF THE STATE

		ANCHORAGE	ALASKA
Farms	Number	291	762
	Acres	36,378	833,861
Market Value of Produce		$30,019,000	$58,925,000
Irrigated Land	Number	98	230
	Acres	1,316	2,450
Farm Jobs Created	Hired Labor	784	1,577
	Payroll	8,697	18,647

In addition to family farming, one third of Mat-Su farms hire farm labor, resulting in 784 jobs.[63] Though farming represents a small proportion of the total number of jobs in the Mat-Su, it is an important part of the region's cultural and historical fabric. The products from farming also serve the local market, resulting in lower prices, higher wages, a cleaner environment and a more stable supply.[64] There is a demand for fresh local food, as can be seen by the number of local farmers markets that have recently popped up. There are now as many as 14 weekly markets in the Anchorage and Mat-Su area, including Palmer's Depot Farm Market, produce sold at Friday Flings, the Wasilla Farmers Market, and the Spenard Farmers Market.

Agriculture has the potential to grow its export industry and return outside dollars to Mat-Su communities. For example, the Mat-Su aims to promote the export of certified seed potatoes to China and Taiwan, a growing market in which Alaska is well positioned due to existing trade relations.[65] The success of farmers markets and a growing exportation industry demonstrate that this is a strategic sector for the economy of the Mat-Su and the welfare of its residents. Thus, agricultural lands are valuable resources that need to be protected. In fact, according to a recent study, preserving existing lands and providing more farmland is the second most important local resource priority on a willingness-to-pay scale.[66] The average household would pay $96.67 annually for agricultural land action, eclipsed only by the value for action on full salmon recovery.[67]

These growing markets may, however, be hindered by loss of agricultural lands. With a rapidly growing Borough population (+57% between 2000 and 2012),[68] agricultural lands have been subject to a series of land use changes that threaten the sustainability of this economic sector. Between 2007 and 2012, for instance, 5% of all agricultural lands in the Mat-Su were converted for industrial or residential purposes.[69] Although the Borough Assembly has reserved funding to assist in the acquisition of development rights to preserve agricultural land,[70] loss of farmland to development remains a challenge.

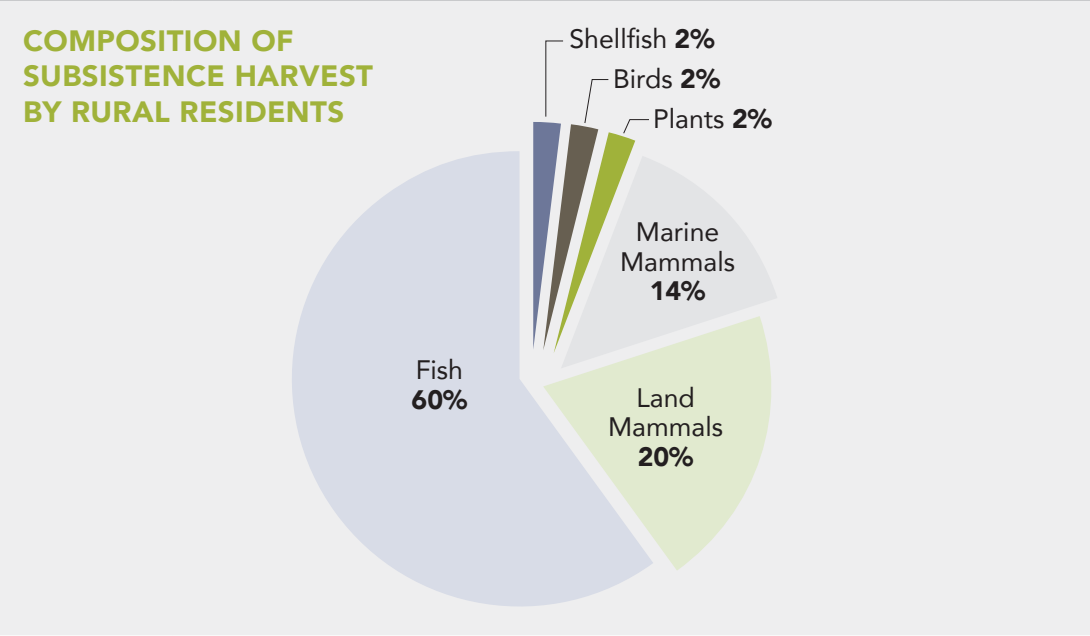
WILD FOOD HARVESTING

In addition to commercial agricultural activities, subsistence gathering also occurs in the Mat-Su Borough. Although it is a small part of the total harvests in the state, amounting to only 2% of the total resource harvests in Alaska,[71] wild food harvest is an important part of the customs and traditions of many cultural groups in Alaska.

Subsistence harvests are defined as the "customary and traditional uses" of wild resources and food. This type of harvesting can consist of varied natural resources, including fish, plants, and wildlife. Wild food harvesting is conducted by local residents only, and, unlike commercial harvests, the yield is typically used directly by the participant and cannot be sold.

Wild food gathering is particularly present in rural areas of Alaska. In rural areas, 75% to 98% of households harvest fish, and 92% to 100% of households share fish for use. Wildlife harvesting occurs in 48% to 70% of households, with 79% to 92% using shared harvested wildlife.[72] Since most rural households depend to some extent on subsistence harvests, the loss of natural areas where the practice takes place could lead to a greater dependence on food banks and imported food for these families.

FIGURE 1 WILD FOOD HARVESTS OF RURAL RESIDENTS OF ALASKA[73]



*There is an exemption in the federal Marine Mammal Protection Act to allow for the traditional harvest and use of marine mammals by coastal Alaska Natives.

In the Mat-Su Borough, wild food harvesting holds a great deal of value that goes beyond monetary value alone. Some suggest that there are two components of value associated with subsistence activities: the value of the products being harvested and the value of the activity itself.[74] This activity value includes both the value of participation and the value of maintaining cultural traditions associated with subsistence activities. Although the activity value may be difficult to put into actual numbers, the product value can be monetized. A 2010 estimate of wild food harvesting in the Mat-Su calculated [75] the total annual harvest at about 2.4 million pounds of food (27 pounds per person), with a total worth of approximately $8.4 million to $16.9 million.

ECONOMIC IMPACT

The Mat-Su's unique agricultural productivity is an incredible asset that provides affordable, healthy food to local residents. Maintaining strong agricultural production also provides steady jobs and increases the Borough's resiliency when facing unexpected droughts, fuel price increases, or conflicts that may cause food shortages or high prices. Similar to the co-benefits of retaining land for recreation and natural hazard mitigation, conserving quality agricultural and subsistence lands provides a wide variety of co-benefits in the shape of ecosystem services such as water supply and climate regulation. The return on investment analysis, which accounts for community assets in the Mat-Su, is found in Chapter 5.

CHAPTER 5

RETURN ON INVESTMENT

The previous chapters summarized various aspects of the Mat-Su community's interaction with public open spaces. Although not all benefits derived from the area's natural capital can be easily quantified, we have dissected some of the most impactful land use activities. Mindful use and management of public open spaces allows for the most sustainable consumption of community assets, but sustainable consumption also depends on being able to quantify and locate the stores of such natural capital. In this chapter, the worth of these benefits, as measured by ecosystem service values, is paired with the healthcare cost savings figures from Chapter 2.

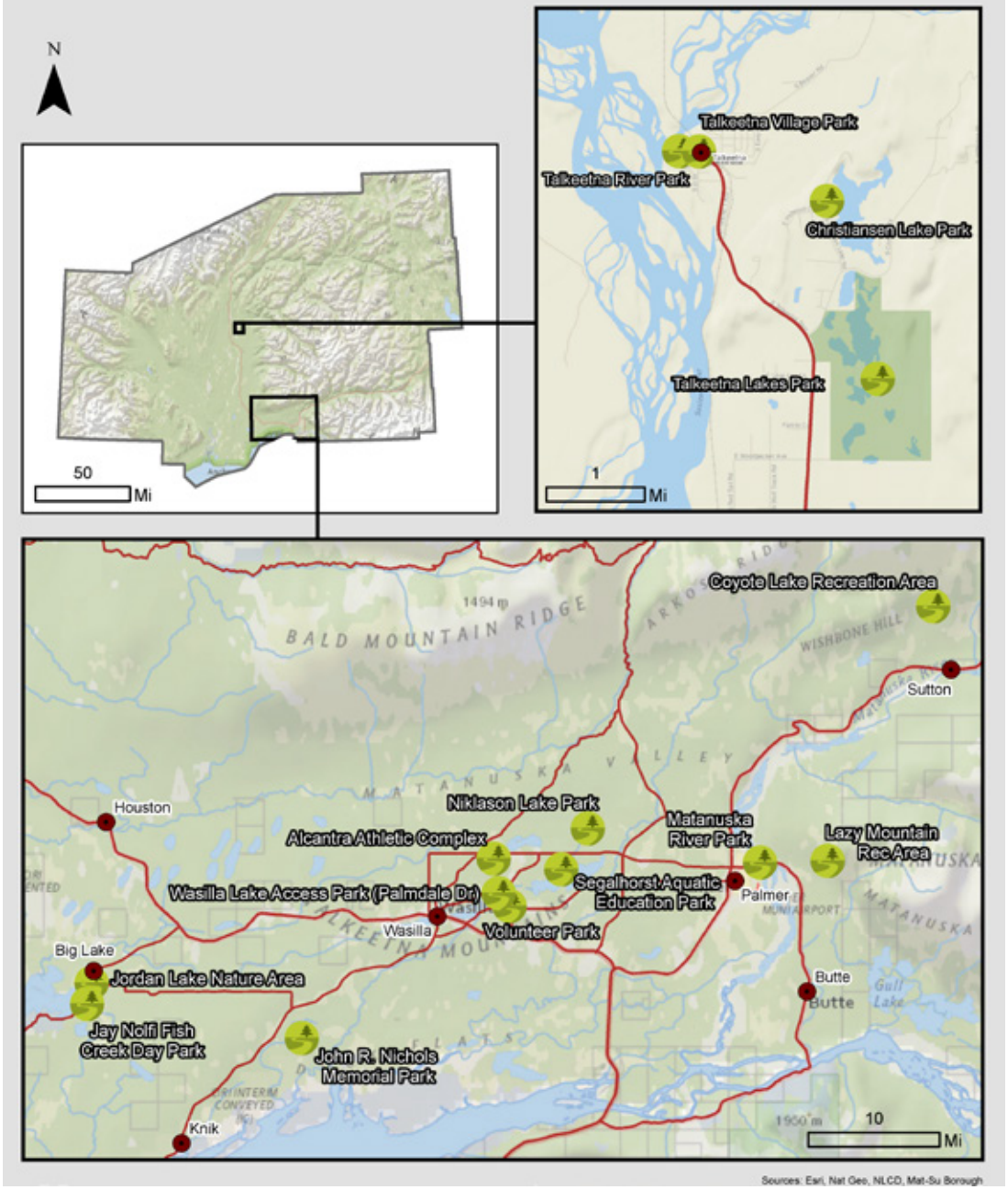
RETURN ON INVESTMENT OF RECREATIONAL LANDS

Bringing together the analyses from previous chapters allows us to quantify the return on investment (ROI) of public spending on recreational lands. An ROI is a performance measure used to evaluate the efficiency of an investment. In this report, the ROI estimates the efficiency of generating community assets and health benefits relative to the monetary cost of operating Mat-Su parks facilities. The Mat-Su's natural areas provide multiple valuable benefits, as identified in Chapters 1 through 4. Synthesizing these benefits in an ROI framework can demonstrate the effectiveness of investments in natural areas. ROI calculations can aid policymakers, private organizations, and the public in recognizing the importance of protecting, maintaining, and enhancing natural lands.

In this analysis, the costs are the total annual costs of operating all recreational areas owned by the Mat-Su Borough, which consist of 1,496 acres of mapped parcels plus other areas with undefined boundaries.[76] This acreage, however, represents only a small portion of the total 352,000 acres of recreational lands available to residents and visitors, including close to 10,000 acres managed by the Mat-Su Borough but owned by another entity such as the State of Alaska. Costs associated with city, state and federal recreational areas were not included in this analysis. For the Borough-controlled acreage alone, the total operating costs are roughly $950,000 for fiscal year 2015 (Table 5).[77]

TABLE 5	COSTS OF RECREATIONAL LAND OPERATIONS IN THE MAT-SU BOROUGH, 2015
COST DESCRIPTION	VALUE
Mat-Su Borough FY 15 Operating Costs for Parks and Trail Maintenance	$952,350
Total Costs	**$952,350**

FIGURE 2 MAP OF PARKS VALUED IN THE ROI ANALYSIS



Two key types of benefits of recreational lands were quantified in this report: ecosystem services and health care cost savings. Ecosystem services, such as habitat for salmon and water supply, were estimated in economic terms using the per-acre values from the 2013 Earth Economics report "The Natural Economy of Alaska's Matanuska-Susitna Basin." Of the 1,496 acres of Borough-owned recreation land, 1,438 acres have land cover types with applicable ecosystem service values. We estimate the total annual ecosystem services benefits of the 1,438 acres to be over $1.8 million. This value was identified through a GIS analysis of the land cover types within the Borough recreational land (see Appendix A for more information). In Chapter 2, the health care cost savings generated by accessible nature were also quantified. Our estimate for the portion of these savings that can be attributed to Mat-Su Borough lands is over $3 million annually. The combined values of ecosystem services and health savings lead to an estimated $5 million in annual benefits.

TABLE 6 BENEFITS OF RECREATIONAL LAND OPERATIONS IN THE MAT-SU BOROUGH, 2015

BENEFIT DESCRIPTION	VALUE
Annual Health Savings via Exercise	$3,238,630
Ecosystem Service Value of Borough Recreational Lands	$1,817,656
Total Benefits	**$5,056,286**

After quantifying the costs and benefits, the ROI was calculated for 2015. According to the analysis, the Mat-Su Borough lands generate over $5 in benefits for every $1 spent. This type of return presents a great benefit to the community and is common with other open space programs throughout rural areas of the United States. See the following section for more context on return on investment for open space in several separate rural jurisdictions.

TABLE 7 ROI RESULTS FOR RECREATIONAL LANDS IN THE MAT-SU BOROUGH, 2015

Total Costs	$952,350
Total Benefits	$5,056,286
Benefit-Cost Ratio	5.31

SUCCESSFUL OPEN SPACE INVESTMENT

Along with the ROI analysis above, examining similar investments elsewhere is an effective way to gauge feasibility for public spending projects. Jurisdictions of all sizes, from municipalities up to the federal government, have all, to various degrees, invested successfully in public open spaces. The following section describes several examples of successful public space investments in places with relatively similar environments and economies to those of the Mat-Su.

In Pinal County, Arizona, residents benefited from $100 million in direct use value and $672,000 in tax revenue from tourist spending by emphasizing sound land use and conservation through county management plans.[78] Residents also received a boost in real estate values to the tune of $190 million due to the proximity of protected open spaces.[79] Voters in Pinal County recognize the benefit public open spaces have in attracting tourism expenditures, protecting vital agricultural land, and mitigating the danger and costs of wildfires, so they continue to support local initiatives for public open space.[80]

In Kansas, the Johnson County Park and Recreation District, which is operated almost entirely from county-level funding, has been a boon for the economy and a lifeline for the natural environment. The value received from the parks and trails system is realized in the form of tourism revenues, decreased costs of storm water management, health cost savings from improved air quality, and a boost in real estate values. In fact, Johnson County parks are responsible for boosting the value of nearby properties a total of $24.1 million.[81]

There are many other success stories in rural districts that illustrate the benefits of spending money on public open spaces. In New Hampshire, a variety of state land conservation projects produced an incredible return on investment of $11 for every $1 spent.[82] In Wyoming, the Wildlife and Natural Resource Trust leveraged public funds to receive matching contributions from private and other public entities. The agricultural plots and rangeland protection that those contributions enabled have resulted in a return on investment of $4 in economic value for every $1 spent.[83]

Throughout the rural United States, communities, counties, and states are acting to protect open spaces. They do so with the knowledge that keeping those lands natural and open for direct public use and enjoyment also results in additional co-benefits. The provision of ecosystem services, increased property values, and health-related savings work in concert to help ensure that an investment in public open spaces is a good one.

CHAPTER 6

TAX REVENUES: A HIDDEN RETURN ON INVESTMENT

In addition to the return on investment of conserving public open spaces, tax revenues are a significant secondary impact that should be taken into consideration when analyzing costs and benefits. More out-of-area visitors drawn to quality parks and trails creates more spending on hotels and other amenities that can be taxed. It has also been shown that certain natural assets, such as streams and freshwater lakes, provide a large premium to property values for Mat-Su residents.

BED TAX

While local businesses benefit directly from visitors' purchases, these expenditures also bring additional benefits to the region as a whole. For example, not only does an overnight visitor bring revenue to a hotel, but the Borough itself also gains an additional 5% bed tax for overnight accommodations. In FY 2015 alone, this tax brought in an estimated $1,100,000 to the Borough's budget.[8485] This bed tax is a valuable source of revenue, especially as there is no sales tax in the Borough. Some cities, however, do gain income from sales tax. Palmer and Wasilla, for example, charge 3% and 2.5%, respectively.

The Borough could act to increase its revenue from tourism-related activities. For example, raising the bed tax would increase revenue without placing a greater burden on local taxpayers. Anchorage currently has a 12% bed tax, so there is plenty of room to raise the bed tax rate for the Mat-Su and remain competitive.[86] With hundreds of thousands of visitors coming to the Mat-Su annually, even a small tax raise, if devoted to conserving public open space and park and trails maintenance, would be a wise economic investment.

PROPERTY TAXES

Property taxes are another source of revenue affected by the proximity of open space. Properties are appraised so that the costs of schools, fire protection, and other public benefits are borne in proportion to the value of individual properties.

People are often willing to pay more for real estate if it is located near environmental amenities. An attractive view, for example, raises real estate value. The contribution of natural amenities to property value is significant, as seen in a Mat-Su based study of the premium people are willing to pay to be located near streams. Fronting a salmon stream adds 70% and fronting a lake adds 76% to property values compared to properties not located near water bodies, but otherwise equal in property size and other factors.[87]

In another measure of the interaction of open space and property values, a parcel in the Mat-Su with a sale price of about $75,000 receives $24,000 of its value from its vicinity to a salmon stream, and an average of $12,000 from the impact of lake proximity.[88] Clearly, lakes and streams are important to Mat-Su residents. People are willing to pay a significant amount of money for a share of Mat-Su's natural capital.

Properties adjacent to open space can increase in value, thus increasing property taxes as well. In fact, 37% of the value of the Mat-Su's residential tax base is attributed to natural assets such as parks, lakes, and streams.[89] Protecting open space can reinforce the value of nearby properties and increase Borough revenues, while at the same time maintaining all of the background benefits provided to the community, namely recreation and ecosystem service values.

CONCLUSION

For the Mat-Su, the return on investments in public open spaces is manifold; investing in this land is a safe bet. Maintaining natural spaces that everyone can access enhances the tourism value of the Mat-Su, allows citizens to engage in more physically and mentally healthy lifestyles, improves community resiliency in the face of natural disasters, preserves cultural and nourishing resources, increases public and private land values, and provides the Borough with a steady source of revenue for public services.

RESULTS

Our study shows that:

- Opportunities for physical activity in open spaces can decrease both health care costs and productivity losses, leading to more than $3 million in savings annually.
- The high cost of natural disaster recoveries, not to mention the loss of human life, can be minimized with well-planned open space preservation.
- The estimated annual value of ecosystem services of the 1,438 acres of Mat-Su Borough owned recreational land is over $1.8 million.

While the figures above paint a positive image of Mat-Su public open spaces, the ROI analysis was crucial to determine the actual costs and benefits of spending money to enhance and preserve open space in the Mat-Su. As Chapter 5 details, we reached a result of a 5.31 return on investment for the Mat-Su Borough owned lands alone, meaning that for every dollar that the Borough invests in open spaces, the payoff is more than $5, an astoundingly good return.

However, as straightforward as it may sound, this suite of benefits can only be attained and the full potential of a robust network of outdoor public spaces can only be realized with the will and encouragement of the citizens of the Mat-Su. One possible way for residents to assert their desires for open space preservation is to support a Mat-Su parks bond in order to finance the maintenance and protection necessary to fulfill those goals. Another way to fund an open space initiative would be to increase taxes focused on tourists, such as the bed tax, or land use fees for non-residents so that those who come to the Mat-Su to take advantage of its bounty also bear some of the cost.

Another strategy Mat-Su residents could use to work together to control the future of their public lands is to work with local groups such as the Great Land Trust and the Alaska Farmland Trust in order to leverage private ownership for conservation goals. Land owners and the general public can find mutually beneficial conservation ends through easements that provide sustainable natural resource harvests while still maintaining protected status to keep natural capital healthy. Mat-Su residents could also form coalitions in smaller areas such as specific communities in order to protect the resources that are most important to them at a micro-level. Communities could, for example, follow the model of New England towns that establish community forests in order to protect adjacent watersheds.

A parks bond, tax revenues, or other public and private investments could cover improved accessibility and signage for trails, an increased scope of the trail systems, and public outreach and education materials to improve understanding of the benefits of natural capital. Private land ownership claims and concerns can also be alleviated by collecting and presenting more precise data. A more comprehensive initiative of mapping public open spaces in the Mat-Su would help to delineate where parks and trails conservation should be focused and where private land ownership should be reinforced. In this way, a strong partnership between private residents and the Borough can be established with both public goods and private property in mind.

Investing in the protection of public open spaces is critical to strengthen the places and amenities that make the Mat-Su a great place to live and work. Open spaces contribute to the economic well-being of the area by providing recreational opportunities for residents, attracting visitors who spend money in local communities, supporting local agricultural production and subsistence harvests, and creating opportunities for major savings in health care costs. Continuing financial support for public open spaces is necessary to ensure the quality of life in the Mat-Su now and for decades in the future. The residents and communities of the Mat-Su benefit economically, socially, and physically when public open spaces and the countless community assets they provide are conserved.

GIS ANALYSIS AND REFERENCES

The ecosystem service value component of the Return on Investment was reached using GIS techniques on the following datasets: *NLCD 2011 Land Cover and Recreation - Local Parks*. From the local parks dataset, the 15 parcels owned and managed by the Mat-Su Borough were selected. Then, the NLCD dataset was clipped to the 15 parcels. Finally, the land cover types were summarized overall for the entire 15 parcels, representing 1,438 acres of parkland.

Parks included in the analysis:

- Talkeetna River Park
- Jordan Lake Nature Area
- Lazy Mountain Rec Area
- Niklason Lake Park
- Alcantra Athletic Complex
- Volunteer Park
- John R Nichols Memorial Park
- Jay Nolfi Fish Creek Day Park
- Coyote Lake Rec Area
- Wasilla Lake Access Park (Palmdale Dr)
- Matanuska River Park
- Segalhorst Aquatic Education Park
- Talkeetna Village Park
- Christiansen Lake Park
- Talkeetna Lakes Park

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