Can Lopez Island Feed Itself?

A Foodshed Assessment of Lopez Island, Washington

Ezra Fradkin

In partnership with Sterling College

Prepared for the Lopez Community Land Trust

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Introduction

A foodshed is the geographic extent of a food supply. A foodshed represents all of the land on which food is produced to feeds a population [1]. In the United States the foodshed often includes many parts of the world, with branches reaching to nearly every continent: bananas from South America, apples from New Zealand, coffee from Ethiopia. In this way, every community is inseparably connected to the world through its foodshed [2].

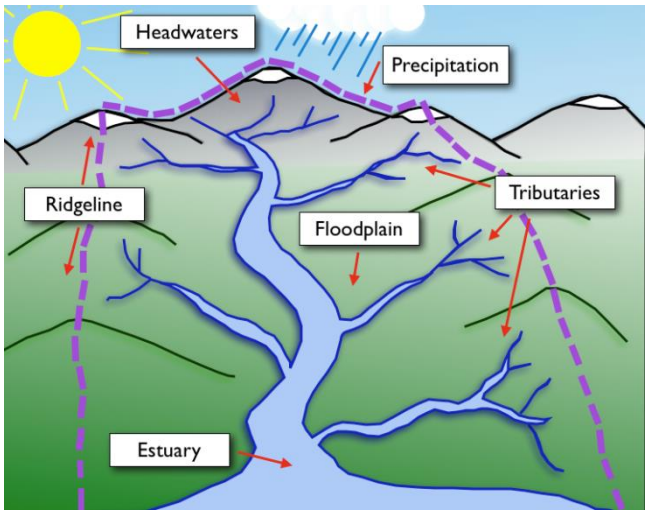


Figure 1: A simple watershed diagram
Image courtesy of Farley Brown

The term "foodshed" was originally used in 1929 by W.P. Hedden, head of the New York City Port Authority, to describe what he observed as the "gigantic traffic" of the food system: the trucks and ships and trains that transport food from the country to the city [3]. Hedden's idea of a foodshed was based off of the watershed, an area of land drained through a common point (Figure 1), but he applied this concept to systems that are not just geographic but social and economic as well.

The "headwaters" of the foodshed are the food producers: farmers and ranchers and fishermen. The "tributaries" of the foodshed are the food distribution mechanisms, the grocery stores and aggregators and shipping lines. The "mouth" of the foodshed is the consumer. This imagery of tributaries draining into rivers helps to connect the often disparate pieces of a food supply for the purposes of local and regional planning [4]. The importance of protecting the headwaters of great rivers is widely recognized by American conservationists. So too do the sources of the foodshed need protection, in this case farms and farmland.

The word foodshed is also used to describe a community's vision for an alternative food system [5]. Thinking about the foodshed can help to reconnect food to place, and can help a community revive its agricultural economy [4]. The movement to conserve our foodsheds has brought about CSAs, farmers markets, farm-to-school programs, food hubs, harvest dinners, and other community celebrations of local food. Conversation about where our food comes from is the first step towards actualizing this vision.

In the United States, food travels an average of 1300 miles before reaching the consumer [5]. Global food distribution systems rely heavily on fossil fuel energy sources, and agricultural production is a major contributor to climate change. Together, the food system is responsible for as much as 29% of total greenhouse gas emissions [6]. Local food systems are widely recognized for their ability to reduce food miles (the distance food travels before it reaches the consumer) while bolstering economic activity within the community [7]. Foodshed assessments are used to support the work of food system relocalization and inform change at a local level.

About This Project

A foodshed assessment is a tool used by local and regional planners to assess the capacity of a population to meet its own food needs from local sources. This assessment was designed and conducted by Ezra Fradkin, a student at Sterling College in Vermont, with sponsorship from the Lopez Community Land Trust (LCLT). The project was carried out in three phases:

Phase 1: Planning & Research Design, Spring 2015

Phase 2: Data Collection & Community Involvement, Summer 2015

Phase 3: Assessment & Analysis, Fall 2015

The objective was to study the Lopez Island food system, assess gaps in food system resources, and identify opportunities to increase food self-reliance. This objective was informed by two prior studies. A 2014 study from the Monterey Institute of International Studies, "Lopez Island 2025: Sustainable Transformations for Resilience," assessed the island's community resources and described a "strong interest in increasing local food production and consumption for economic, environmental, and health reasons" [8]. A report from the Washington State Office of Farmland Preservation, "Growing Our Future: An Agricultural Strategic Action Plan for San Juan County, WA," outlined a goal to "develop strong local and regional market opportunities in order to sustain and expand the local agricultural economy" [9]. These two reports provided the background interest for this research. The foodshed assessment builds on the existing work of the Lopez Community Land Trust and supports LCLT's goal to increasing local food consumption on Lopez.

Photo by Scotty Lanham

About the Author:

Ezra Fradkin is an undergraduate at Sterling College in Craftsbury Common, Vermont. For the past three years he has been intensely focused on coursework surrounding sustainable agriculture, food systems, and community development as part of his major in Civic and Community Agriculture. As a participant in LCLT's internship program in 2014, he worked as a farmhand at Horse Drawn Farm. Ezra brings his knowledge and passion for community food systems from his home in Amherst, Massachusetts, an epicenter of local food and farming and the birthplace of the local food movement. He is reachable by email at efradkin@sterlingcollege.edu

Research Questions

1. **What is the current level of food self-reliance on Lopez Island?**
    a) What is the total economic value of food produced by farms on Lopez?
    b) What is the economic demand for food on Lopez?
    c) What portion of the the food consumed on Lopez comes from local[1] sources?
2. **What is the capacity for agricultural production on Lopez?**
3. **What barriers prevent the increased production & consumption of local foods?**

[1] *For the purposes of this project, "local" is defined as "grown in San Juan County, Washington."*

Methods

The data used for this project was gathered during the summer of 2015 through a series of three surveys carried out in the Lopez Island community. The three surveys included:

a) Producer Survey (farms)
b) Distributor Survey (restaurants, grocery stores, and food businesses)
c) Consumer Survey (citizens)

For the producer survey, 25 farms participated, representing an estimated 80% of total farm production. For the distributor survey, eight restaurants, two bakeries and two grocery stores participated, representing an estimated 80% of distributors. For the consumer survey, 184 households participated, representing 344 individuals, or 14% of the full-time population (Table 1 & Figure 1).

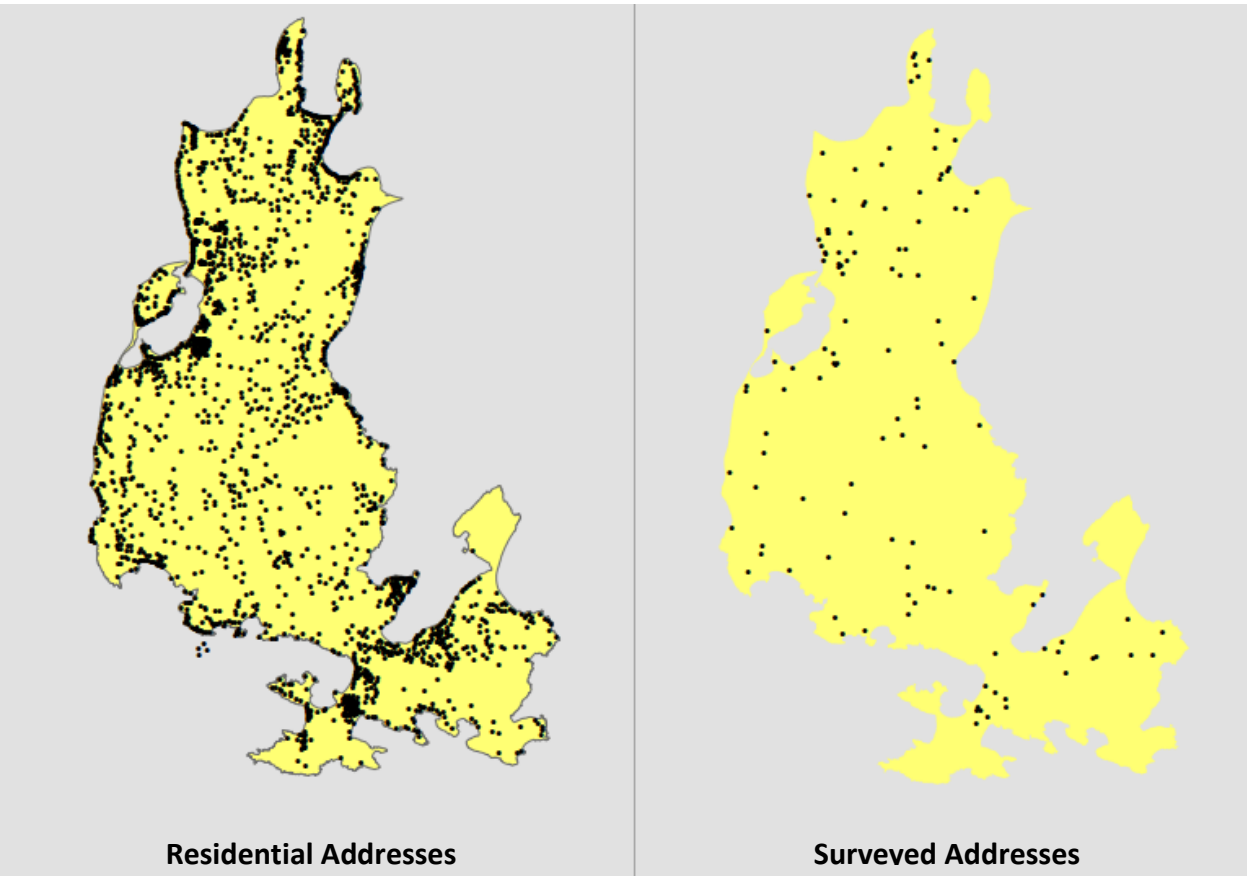
During data collection, efforts were made to survey a representative sample of the total consumer population. Data collection took place over 8 weeks from June 16 through August 18, 2015. During this time, the surveys were available on the project website (www.lopezfoodshed.weebly.com) as well as on paper. Pre-addressed stamped envelopes were included with paper surveys. Posters were displayed at prominent locations across the island. The survey was also available on the web forum "Lopez Rocks" (www.lopezrocks.org). In addition, the project was promoted on Lopez Community Radio (KLOI, 102.9), via the prominent blog "Project 468" (www.project468.com), through the Lopez Community Land Trust's email listserv, and through a print advertisement in the *Islands' Weekly*.

Specific targeted outreach was carried out to reach less represented populations. These methods included a poster display in the Lopez Fresh food bank, a presentation to the Center Church Lutheran congregation, a presentation to the Lopez Lions Club, and outreach at the Solid Waste District's "Take-It-or-Leave-It." Display tables were set up periodically at the Lopez Village Market (2x), the South End General Store (1x), the Islands' Energy Fair (1x), and the Lopez Farmer's Market (2x).

Table 1: Demographics of the surveyed population compared with the total population

	Total Population Source: 2013 American Community Survey	Surveyed Population
Average Household Size	**1.97**	**2.02**
Median Age	**57.2**	**59.5**
Population under 18 years	**13.4%**	**11.5%**
Population over 65 years	**29.9%**	**37%**
Median Household Income	**$50,278**	**$58,000**
Households Enrolled in SNAP[2]	**10.5%**	**5.3%**

Figure 1: Addresses of surveyed households compared with the total households



[2] Supplemental Nutrition Assistance Program

Information reported in the Producer Survey was used to estimate the total economic value of food produced. Information reported in the Consumer Survey and the Distributor Survey was used to estimate the economic demand for food and the percent of food consumed on Lopez that is local. In addition, each stakeholder was asked the question, "What do you view as the biggest barrier to accessing local food on Lopez?" Responses to this question were then categorized and analyzed based on the frequency with which various barriers were reported.

To assess the capacity for food production on Lopez, a suitability analysis was done for farmland potential using ArcGIS software. This model was based off of the analysis done by Blum-Evitts (2009)[10], but expanded the scope of inputs analyzed. Inputs into the analysis included slope, aspect, soil type, land use designation, land cover, building footprints, and road footprints. Values for each input were reclassified using either the "Rescale by Function" tool or the "Reclassify" tool and assigned a weight according their relevance to farmland suitability. Seven layers were then combined using the "Weighted Sum" tool to create a continuous layer called "Farmland Suitability." The final output was classified into three categories based on the raster value of the data.

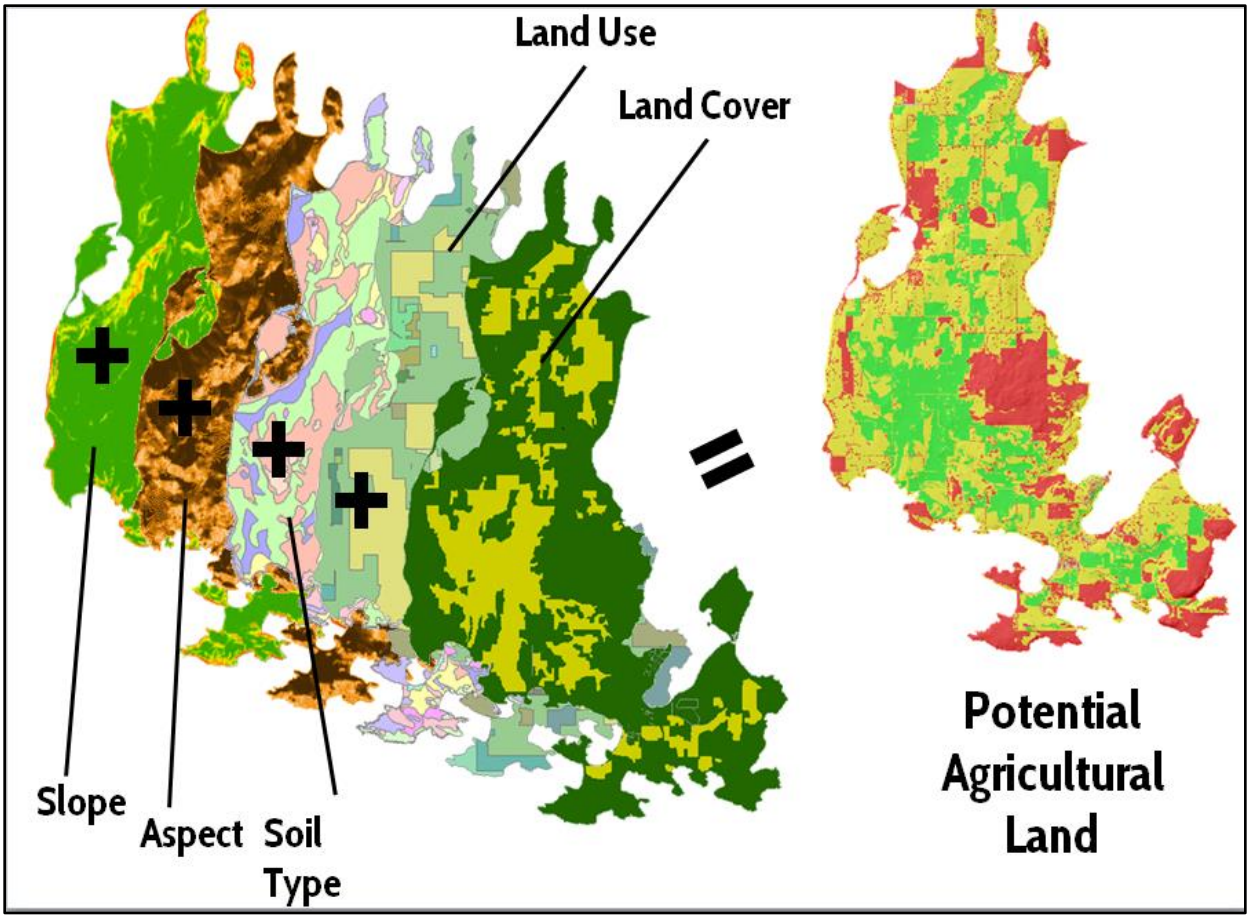


Figure 2: Layers input into the Farmland Suitability layer

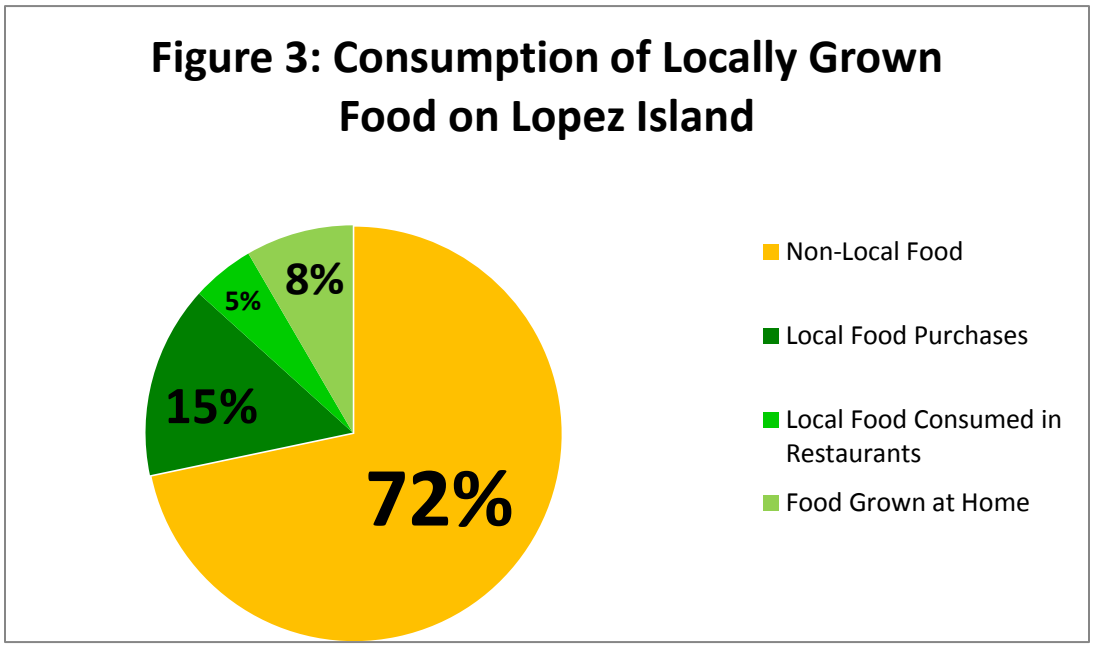
Results

What is the current level of food self-reliance on Lopez Island?

Production: In 2014, Lopez Island farms produced an estimated **$1.6 million** worth of food on 3750 acres. The average rate of production among the surveyed farms was $427 per acre. Of the total production, 52% was sold at retail value, and 48% was sold at wholesale value.

Consumption: Full-time residents on Lopez Island will purchase an estimated **$9.4 million** worth of food this year. Additionally, restaurants will purchase an estimated **$1 million** worth of food. Therefore, the total value of food consumption on Lopez Island is estimated at **$10.4 million**. These calculations used self-reported expenditures from the surveyed population extrapolated to fit the total population.

Local Food: Figure 3 shows the composition of the Lopez Island diet broken down by categories of local food. The full methodology and formula for calculating local food production can be found in the appendix.

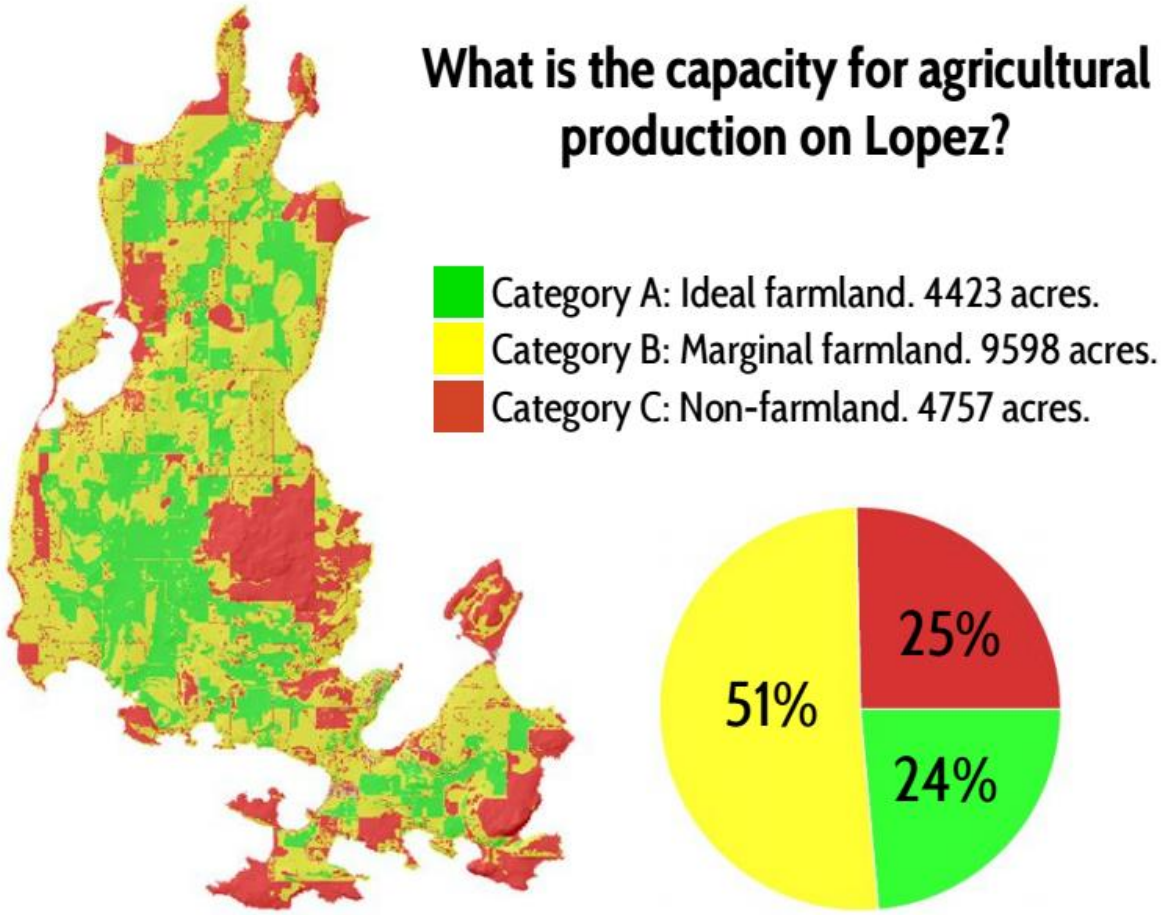


In addition to the $9.4 million of food purchases, households on Lopez grow an estimated **409,000 pounds** of food annually on **26 acres** of home gardens. The average American eats just under 2,000 pounds of food each year [11]. This number was used to estimate the amount that food produced at home offsets food purchasing. It was estimated that **8.4%** of the food consumed on Lopez Island is grown in home gardens.

What is the capacity for agricultural production on Lopez?

The results of the GIS analysis identified **4423 acres** of ideal farmland on Lopez, and an additional **9598 acres** of marginal farmland that could potentially be used for food production. The remaining **4757 acres** are not usable for food production (see below).

Assuming the average rate of food production on Lopez ($427 per acre), Lopez Island could produce **$1,888,621** worth of food each year on ideal farmland to meet **18%** of the island's food needs. If marginal land were used, assuming the same rate of production, Lopez Island could produce **$5,986,967** worth of food to meet **58%** of the island's food needs.



Ideal farmland *is land that has agricultural soils of statewide importance, is zoned in an agricultural or rural farm forest designation, is buffered from conservation areas, densely populated areas, buildings, and roads, and is open or partially open.*

Marginal farmland *is land that has soils of statewide importance or otherwise classified agricultural soils, is zoned in an agricultural, rural farm forest, or rural residential designation, is buffered from conservation areas, densely populated areas, buildings, and roads, but may be either partially or heavily forested.*

Non-farmland *is land that has poor agricultural soils, is designated for conservation, urban growth, industrial, or commercial use, or is occupied by the built environment and/or by water.*

What barriers prevent the increased production & consumption of local foods?

A series of qualitative questions included in each of the surveys were used to assess the stakeholders' perceptions of the barriers preventing increased local food production and consumption. Word clouds (shown below) were used to demonstrate the frequency that themes occurred within the responses. Responses are sized according to the frequently of their occurrence. A summary of these responses and a list of subsequent opportunities are presented below:

Producers:

Barriers:

- Cost of production & locational challenges (i.e. limited water resources)
- Lack of access to farmland & suitable land use
- Lack of reliable labor, especially skilled labor (i.e. farm managers)
- Access to infrastructure for food processing and distribution
- Limited local market opportunities

Opportunities:

- Create a community-owned commercial kitchen for value-added food production and food processing
- Invest in incubation farmland and infrastructure for new and beginning farmers
- Expand LCLT's internship program to bring consistent supply of labor to farms

"[We need to] delve deep into the psychology of how to tap into local food resistance. Too expensive? Yes, but how will you support your local families and friends and see the money go around?"

- Lopez Island Farmer

Distributors:

Barriers:

- Cost of locally grown foods compared with foods from off-island
- Quality & consistency of supply
- Lack of centralized distribution system for purchasing and delivery
- Limited availability & seasonality of local products & specialty cuts of meat

Opportunities:

- Invest in resources that support cost-competitive farm production and consistency of supply
- Establish a food hub or central distribution system to aggregate farm products for delivery
- Continue to provide consumer education about the value of local food products
- Collaborate with the Lopez Chamber of Commerce to create a guide that lists businesses that use locally grown food, similar to the Farm Products Guide
- Promote Lopez Island as a destination for local food and farm-to-table cuisine

"We currently purchase locally grown food for our business. If it's grown here, we use it. The only way for us to use more locally grown food is for there to be more locally grown foods [available]. As we grow and develop relationships with farmers we expect even more of what we use to be grown on Lopez."

- ***Lopez Island Business Owner***

Consumers:

Barriers:

- Cost of locally grown foods compared with foods from off-island
- Availability & seasonality of local products
- Lack of access to local food
- Convenience
- Ingrained personal habits
- Lack of education about where & when local products are available

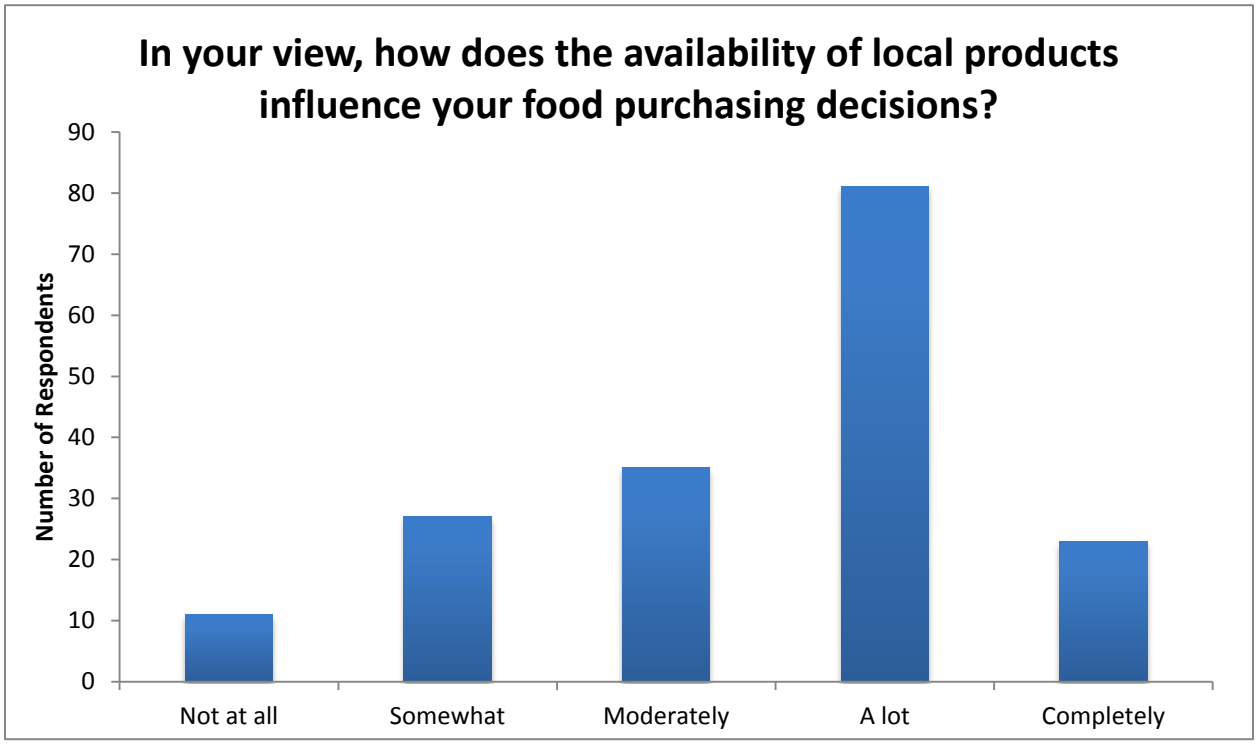
Opportunities:

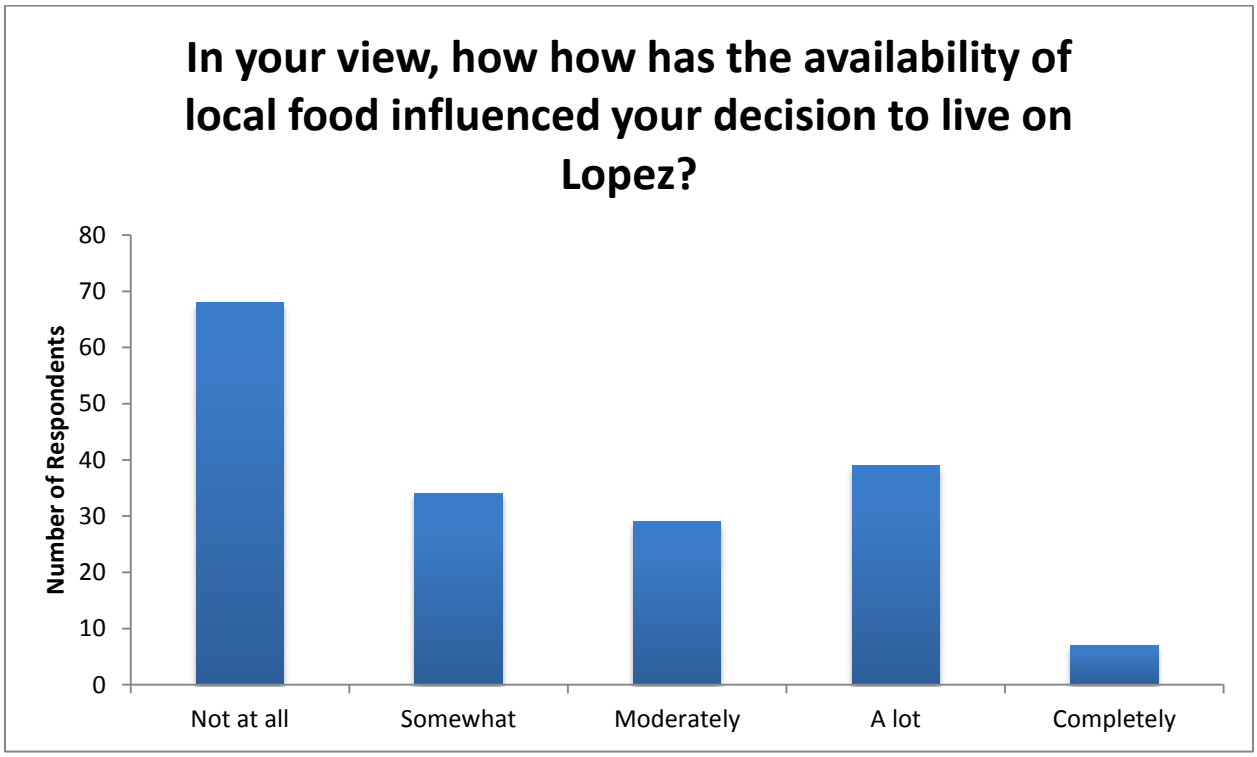
- Investigate the feasibility of accepting SNAP/EBT at the Farmer's Market and local farm stands
- Investigate the feasibility of a cost-shared, multi-farm community-supported agriculture (CSA) program to improve local food access
- Continue to provide consumer education about local food products

"Access for most foods here is pretty easy (except dairy). We are willing (and fortunately able) to pay the price for locally-grown food. I'd say is the biggest barrier is our own desire for exotic foods (coffee, chocolate, bananas, avocados, olive oil, imported cheeses, canned sardines and tuna, nuts, wine, spirits). These are our biggest downfalls. We could, however, make the choice to forgo those non-local items and eat nearly totally locally. For many others on the island, I suspect cost is a big factor. Perhaps many don't even know the extent of what is available."

- ***Lopez Island Consumer***

In addition to their perception of barriers in the food system, consumers were also asked about the ways in which local food influenced their purchasing decisions and their decision to live on Lopez. The results from these questions are shown below:





Conclusion

The results of this study show that the value of food consumed is significantly beyond the current level of food production. Furthermore, using current practices there is not enough agricultural land to produce food equivalent to the current level of demand. However, under the current production scenario, there is the potential to significantly increase food self-reliance by expanding the land used for agriculture on Lopez Island.

Despite the disparity between production and consumption, Lopez Island sources nearly 1/3 of its food locally when food produced in home gardens is included. The rate of production in home gardens averages 15,000lbs per acre, which is significantly higher than the rates of production on many Lopez Island farms. If the food produced in home gardens was valued at just $1 per pound, the rate of production could be as high as $15,000 per acre, a rate exceeded by only three production farms on Lopez.

The average rate of production among Lopez Island farms is $427 per acre, which is just under the national average of $431 per acre. However, the range of production rates included in this average is significant. On the low end, farms produce at rates as low as $68 per acre. On the high end, farms produce more than $30,000 per acre. This suggests that there is significant opportunity to increase farm-based revenue by considering alternate methods of production.

Photo courtesy of Doug Benolil

In addition to rethinking production practices, there is an opportunity to increase food self-reliance through a shift in diet preferences. Prior research has shown that individual foodprints (the amount of land needed to meet one person's annual food needs) can be reduced dramatically based on dietary choices [12]. This evokes a larger community conversation between producers, consumers, and distributors about the community's foodshed vision.

This study revealed a number of barriers preventing increased production and consumption of local foods on Lopez. These barriers provide insight into opportunities to invest in infrastructure, education, and community partnerships that will bring more local food to the table.

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Further Reading

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Appendix A: Participating farms and businesses

Participating Farms:

Flint Beach Ohana LLC
Saddleback Ranch
Sunnyfield Farm
S & S Center for Sustainable Agriculture
Crowfoot Farm
Windsock Farms
Fruit City Farm
One Clay Hill Farm
The Sweetbriar Farm
Skip's Beef
Horse Drawn Farm
Lopez Harvest
Chickadee Produce
Redgate Farm
Lopez Island Farm
Sweet Grass Farm
Buffum Brothers Farms
Jones Family Farm
T & D Farms
Lopez Island Vineyard
Wet Wool Farm
Double R Bar Ranch
Helens' Farm
Lopez Island Farm Education
Carter Farm

Participating Restaurants:

Vita's
Vortex
The Bay Cafe
Galley Restaurant
Southend Restaurant
Barn Owl Bakery
Islander Restaurant
The Edenwild
Haven: Kitchen and Bar
Holly B's

Participating Stores:

Lopez Village Market
Blossom Organic Grocery

Appendix B: Formula for determining an island's local food consumption (Based off of CISA):

$L_n = B_n + G_n + O_n$
$B_n = ((a_n \times g) + (b_n \times h) + (c_n \times i) + d_n + e_n + f_n) \div T_n$
$O_n = R_n \times 0.13$ [3]
$G_n = (((j_n \times 26) + (k_n \times 26) + l_n) \div m_n) \div 2000)$ [4]
$(L_1 + L_2 ..... L_n) \div 184$ = Percent of Lopez's food consumption that is locally grown

Where
L_n = Percent of Household *n*'s total food consumption that is local
B_n = Percent of Household *n*'s food purchases that are local
G_n = Percent of household *n*'s food that is grown at home
R_n = Percent of household *n*'s food that is eaten outside the home
O_n = Percent of household *n*'s food eaten outside the home that is local
T_n = estimated total weekly food expenditures for household *n*

a_n = $ spent per week at Lopez Village Market by household *n*
b_n = $ spent per week at Blossom by household *n*
c_n = $ spent per week at the South End General Store by household *n*
d_n = $ spent per week at the Farmer's Market by household *n*
e_n = $ spent per week at a Farm or CSA on Lopez by household *n*
f_n = $ spent per week at another local source by household *n*[5]
g = % of food sold at Lopez Village Market that is local
h = % of food sold at Blossom Organic Grocery that is local
i = % of food sold at the South End general Store that is local

j_n = lbs of food grown in home garden each week in the summer in household *n*
k_n = lbs of food grown in home garden each week in the winter in household *n*
l_n = lbs of food grown each year outside of gardening in household *n*
m_n = number of people in household *n*

[3] On average, 13.45% of food served in restaurants on Lopez is locally grown.
[4] The average American consumers approximately 2,000 pounds of food each year [11].
[5] Items in the "other" category of the survey were determined as either "local" or "nonlocal" based on the description provided by the surveyed. Responses that did not have a description were determined "nonlocal".