

**FOOD PRODUCTION:
AGRICULTURAL HISTORY**
CENTRAL PUGET SOUND
FOOD SYSTEM ASSESSMENT

**REGIONAL FOOD POLICY COUNCIL
& UNIVERSITY OF WASHINGTON
JUNE 2011**



PREPARED FOR THE REGIONAL FOOD POLICY COUNCIL
at the Puget Sound Regional Council

Councilmember Richard Conlin, Chair
Brad Gaolach, Vice-Chair

SPECIAL THANKS TO

Alon Bassok, Olivia Robinson, and Liz Underwood-Bultmann, Puget Sound Regional Council Staff
Megan Horst, Food Policy Council Intern, Puget Sound Regional Council
Roy Breiman, Chefs Collaborative
Linda Neunzig, Snohomish County

ACKNOWLEDGMENTS

Erik Baker, Kitsap County	Commissioner Charlotte Garrido, Kitsap County
Lindy Bannister, Wedge Community Co-op	Kate Halstead, Sno-Valley Tilth
Jim Barham, U.S. Department of Agriculture	Dan Hulse, Tahoma Farms
Brynn Brady, Pierce County	Louis Javeta, Bounty Hunter Seafood
Laura Flores Cantrell, Washington Farmworker Housing Trust	Carol Krause, Snohomish County Growers Alliance
Kate Collier, Local Food Hub	Bobby Moore, Willows Lodge
Doug Collins, Washington State University	Elliott Ryan, Latona Pub
Steve Evans, King County	

PREPARED BY
University of Washington Department of Urban Design and Planning
Graduate Students

Anne Broache	Ginger Daniel	Michael Goldman
Andreas Piller	Jenny Ngo	Michael K. Ward
Bo Wang	Joel McMillan	Michelle Umadhay
Briana Lovell	John Murphy	Patrick Green
Cameron Duncan	Jonathon Morrison Winters	Stefanie Young
Emily Anne Lindsey	Joming Lau	Tim Lehman
Erica Bush	Josh Vitulli	Ting Chen
Erika Harris	Kate Bonaparte	Travis English
Eun Jin Shin	Lisa Sturdivant	Virginia Werner
Eva Ringstrom	Matt Beal	

FACULTY

Branden Born, Associate Professor of Urban Design & Planning
Hossein Estiri, Teaching Assistant

June 2011

For more information contact studio67@uw.edu
View the studio team's full reports at <http://courses.washington.edu/studio67/psrcfood>

PROJECT BACKGROUND

This project represents the final product of a twenty-week graduate studio course in the Department of Urban Design and Planning at the University of Washington's College of Built Environments. The studio team members come from a range of backgrounds, including urban planning, urban design, architecture, landscape architecture, real estate development, and public affairs and policy.

The Regional Food Policy Council enlisted the University of Washington studio team to identify and pursue research topic areas examining the regional food system. The Council sought to meet two major goals: creating a common knowledge base among Council members about the region's food system and informing the development of early action items on the Council's work plan.

During the first half of this project, the studio team produced a report describing the current state of the food system in the central Puget Sound region, composed of King, Pierce, Snohomish, and Kitsap counties. Through compiling this initial conditions report, the team developed a thorough understanding of five components of the region's food system (production, processing, distribution, consumption, waste stream) and four other topics that impact, and are impacted by the region's food system (the environment and tribes, restaurants, and comprehensive plans). The team compiled existing data on each topic and identified strengths, challenges, and outstanding questions, culminating with a presentation to the Regional Food Policy Council on March 11, 2011.

During the second half of this project, the studio, in partnership with Regional Food Policy Council staff, prioritized six more specific topics for further study based on the findings from the initial conditions report. Each topic addresses an emerging issue in the food system, gaps in existing data, and policy or programmatic needs identified jointly with the Regional Food Policy Council. The studio team employed a variety of research methods, including field data collection, archival research, policy scans, geospatial analysis, case studies, and interviews with food systems stakeholders. Each element of the project is a standalone report and is described in more detail below.



REGIONAL FOOD POLICY COUNCIL HISTORY AND CONTEXT

The Regional Food Policy Council, chaired by Seattle City Council President Richard Conlin, comprises 30 members representing all parts of the food system as well as government, social justice, anti-hunger, educational, and economic development organizations. The Regional Food Policy Council is housed within the Puget Sound Regional Council, the federally recognized Metropolitan Planning Organization for the central Puget Sound region, serving King, Pierce, Snohomish, and Kitsap counties. The Regional Food Policy Council is a working advisory committee that reports to the Puget Sound Regional Council's Executive Board and provides regional structure and coordination on food system issues.

The Regional Food Policy Council's formation reflects from the incorporation of the food system into the planning lexicon, as planners and policymakers are increasingly aware of the food system's widespread influence on the economy, environment, and society. Since convening its first public meeting in September 2010, the Regional Food Policy Council has established its vision, goals and mission statements, and is currently developing its future work plan.

Regional Food Policy Council Vision and Mission

Vision: The Regional Food Policy Council envisions a thriving, inclusive and just local and regional food system¹ that enhances the health of: people, diverse communities, economies, and environments.

Mission: The Regional Food Policy Council develops just and integrated policy and action recommendations that promote health, sustain and strengthen the local and regional food system, and engage and partner with agriculture, business, communities and governments in the four-county region.

Regional Food Policy Council Goals

- **Agriculture:** strengthen the economic vitality and viability of farming and promote a vibrant community of farmers; maximize opportunities for farming across scales; preserve land for farming.
- **Economic Development:** advance regionally-scaled infrastructure; enhance economic viability of local and regional food systems; support living-wage jobs and occupations.
- **Education:** foster education about and understanding of food, agriculture and environmental protection; facilitate outreach and education among elected leaders and communities.
- **Environment:** promote sustainable agriculture and protect the environment.
- **Equity:** promote equity and access to affordable, nutritious food; strengthen local and regional food systems and increase community food security.
- **Health:** improve public health through food access, nutrition and production; improve the health, safety, and welfare of workers and worker rights and reduce environmental health risks.
- **Policy:** connect local and regional efforts with statewide, national, and international efforts to strengthen local and regional food systems; develop model policies for use by jurisdictions in support of all goals; sustain Regional Food Policy Council.

¹ The food system is the network of people and activities connecting growing and harvesting, processing, distribution, consumption, and residue utilization, as well as associated government and non-government institutions, regulations and programs.

OVERVIEW OF REPORTS

FOOD PRODUCTION

The Food Production report comprises three distinct sections: Rural Agriculture, Fisheries, and Urban Agriculture.

Rural Agriculture

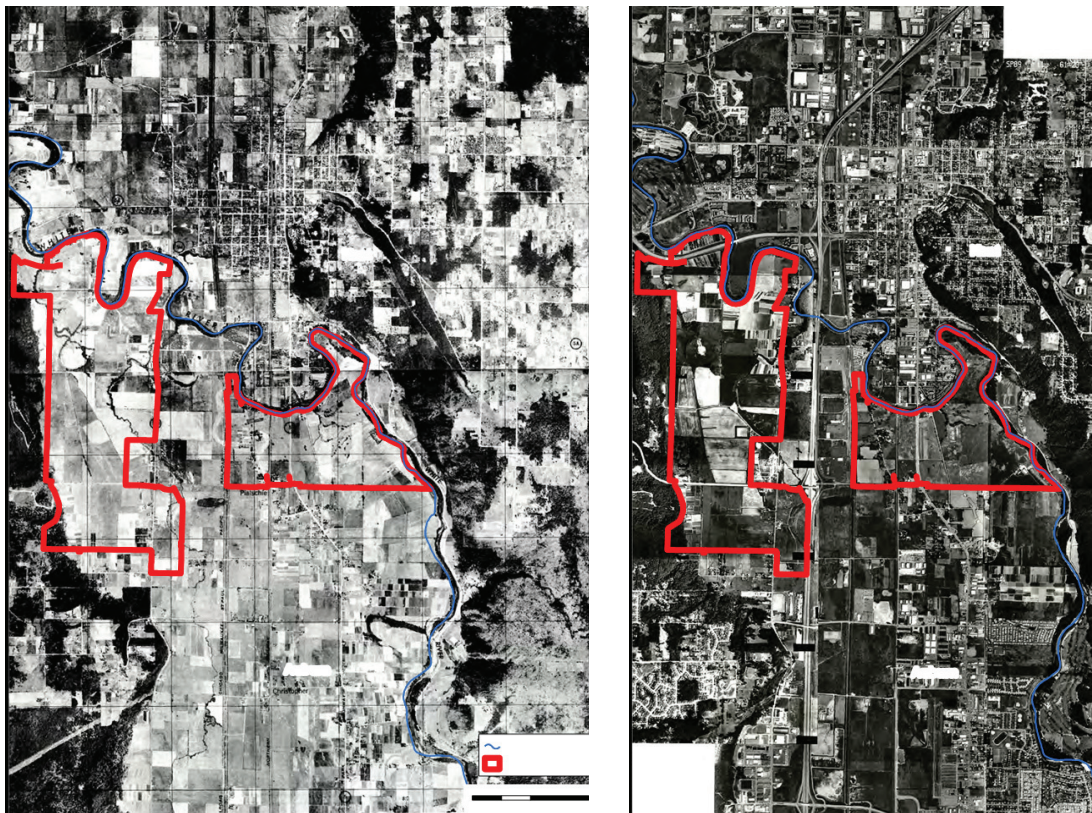
Rural agriculture is a large component of the food system within the central Puget Sound region. This section explores how each county inventories farmland. In an effort to advance the Regional Food Policy Council's *agriculture* goal, which includes farmland preservation, this section identifies key steps to understanding how farmland is classified throughout the region.

Major findings from this report include:

- Each county in the central Puget Sound region uses different tools to inventory agricultural land, including Open Space Tax Classification, windshield surveys, and community outreach.
- Each of these tools offers benefits and limitations. For example, windshield surveys can provide an accurate survey of crop types but consume large amounts of staff time. The Open Space Tax Classification method (allowing owners of farm and agricultural land to have their property valued at current use rather than highest and best use) enables counties to identify farms whose land owners want to save money on taxes, but some farmland owners do not desire the land use restrictions and criteria associated with this classification.
- If each county uses similar data collection methods, the Regional Food Policy Council could have a better understanding of rural agriculture across the central Puget Sound region. It would be helpful for the Regional Food Policy Council to convene managers of county agricultural data collection to share best practices. Additionally the Regional Food Policy Council can support uniform data collection and suggest base farmland data that each county can collect.



<http://www.healthypierce.org/projects-programs/achieve-community-gardens-committee/university-washington-giving-garden/>



The change in agriculture lands in King County from 1944 to 1989

Additionally, the studio team provided a geographic analysis of land cover patterns in three time periods: 1944, 1989-1991 (pre-Growth Management Act), and 2001-2002 (post-Growth Management Act). This analysis demonstrates visually how land use has changed in response to the policies in place during those time periods. Aerial photography shows urban and suburban development near the borders of county-designated agricultural lands. Alongside designated agricultural lands, the maps demonstrate infill of non-designated, undeveloped lands between the early 1990s and early 2000s. This visual analysis articulates the history of rural farmlands and the development pressures that cause land use change.

Fisheries

The state of fisheries has changed greatly since the early 1900s, but minimal data is currently available on the precise role of commercial fishing in the central Puget Sound region. Today, fewer fishing vessels have a home port in the region, the estimated value of the fisheries has decreased, and the average ex-vessel² price per pound for Puget Sound's iconic salmon is less than in 1950. The purpose of this report is to further the Regional Food Policy Council's *economic development* goal through an inventory of commercial fishing vessels, as a starting point, to better understand the economic impact the local fishing fleet has on the region.

Major findings from this report include:

- In recent years, there has been an overall decrease in the number of commercial fishing vessels the central Puget Sound region.

² Ex-vessel prices are the amount a commercial vessel makes when it unloads its catch, rather than how much is received at market

- Economic impact studies of the Port of Seattle's Fishermen's Terminal show that a fishing vessel has a significant impact on the region's economy. For example, *The 2007 Economic Impact of the Port of Seattle*, prepared by Martin Associates (2009) estimates one purse seiner (a type of commercial fishing boat) contributes approximately \$220,000 annually. A commercial crabber contributes approximately \$550,000 annually.
- The number of commercial fishing vessels with a home port at Fishermen's Terminal in Seattle declined from 370 to 250 vessels between 2003 and 2007.
- Similarly, the number of jobs these commercial vessels supported declined from 5,524 to 3,424 jobs between 2003 and 2007.
- This decline impacts the local economy: in 2003 the vessels at Fishermen's Terminal brought in \$179.6 million to local businesses, compared to only \$43.8 million in 2007.
- It is difficult to determine the number of fishing vessels moored in each of the four counties, due to the nature of how the Washington Department of Licensing collects data. As a result, it is difficult to clearly understand what social and economic impacts these fishing vessels have on their home ports and markets in the region (beyond the recent economic impact study of Fishermen's Terminal in Seattle).
- Efforts could be taken to ensure that the region maintains a large fleet. Instead, a combination of factors has caused fisherfolk to relocate from the region or quit fishing altogether. Many vessels are moving north to the Port of Bellingham where local officials have realized the benefit of having a large fleet and are lowering moorage rates, enhancing amenities, and providing convenient access to nearby processors and icehouses.



Urban Agriculture

This section uncovers opportunities for urban agriculture in the central Puget Sound region that coincide with the Regional Food Policy Council's goals of *agriculture, economic development, education, environment, equity and health*. The studio team examined urban agriculture based on the Community Food Security Coalition's definition, in which urban agriculture "refers to the production, distribution and marketing of food and other products within the cores of metropolitan areas...and at their edges." The studio team focused its research primarily on the five metropolitan cities in the region as designated under *VISION 2040*—Bellevue, Bremerton, Everett, Seattle, and Tacoma—but believes the framework and methodologies it created can be extended to smaller suburban cities for future assessment.

The goals of this section are:

- To broaden Regional Food Policy Council's understanding of the potential scope of urban agriculture in North America
- To explore the current practices in the central Puget Sound region
- To identify where area comprehensive plans can address urban agriculture
- To identify future opportunities for more urban agriculture regionally

Major findings from this report include:

- North American urban agriculture takes many forms beyond traditional community gardening, including backyard garden programs for food-insecure residents, prison gardens, and commercial rooftop farms.
- Each of the five metropolitan cities (Bellevue, Bremerton, Everett, Seattle, Tacoma) addresses urban agriculture in different ways (e.g., through city ordinances, specific codes/zones, and plans). Tacoma has the most detailed comprehensive plan and urban agriculture-related policy coverage, which may serve as a model for other cities in the region.
- The studio team proposes a new methodology, based on existing land use data and aerial photography, to determine potential sites for implementing urban agriculture. This site assessment considers:
 - environmental characteristics (e.g., steep slopes and other ecological barriers),
 - community needs (e.g., residential density and proximity to existing community gardens),
 - accessibility factors (e.g., parking availability and pedestrian access), and
 - differences in land use ownership (e.g., private, public, and institutional lands).



From Left to Right:
University Of
Washington
Tacoma -
Giving Garden

Urban Chickens

University
P-Patch

FOOD DESERTS

Food deserts are areas “with limited access to affordable and nutritious food, particularly such an area composed of predominantly lower-income neighborhoods and communities,” according to the 2008 U.S. Farm Bill. This report focuses on identifying food deserts in the central Puget Sound region, with a focus on how transportation networks can aid or interfere with access to healthy food. The studio team further defined access to “affordable and nutritious food” through availability of the following food retail outlets:

1. Full-service grocers, which provide access to a full range of healthy food
2. Specialty foods outlets, which provide access to some healthy foods but not a full range (butcher, bakery, etc.)
3. Cultural grocers, which provide ethnically significant food access points

The studio team employed a geographic information systems analysis to locate census blocks lacking the specified food retail outlets within a quarter mile from bus stops in King, Pierce, Snohomish, and Kitsap Counties. The analysis incorporates data on bus line and stop data, income, vehicle ownership, locations of elderly populations, and locations of the three types of grocers described above.

Example of Food Desert Analysis

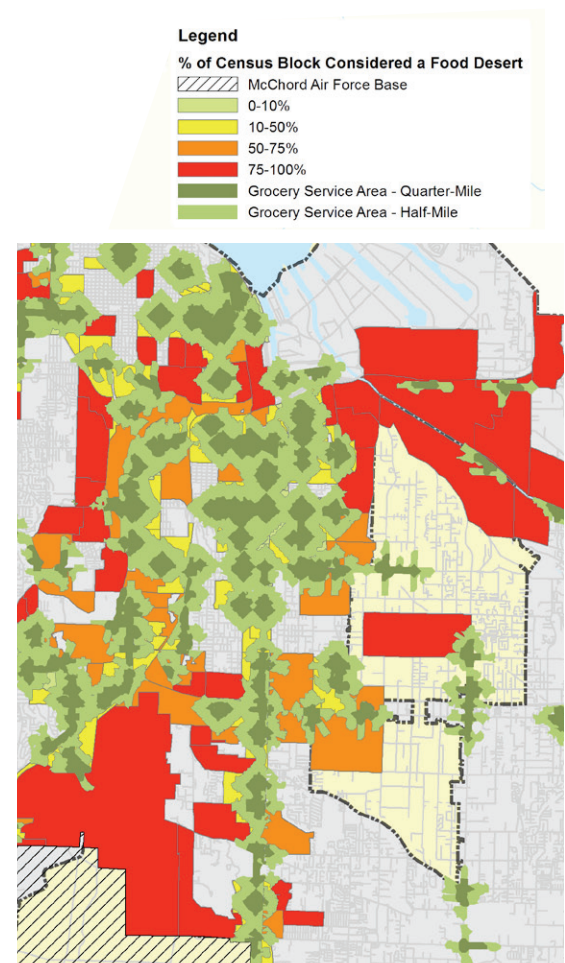
Major findings from this report include:

- Urban cores tend to have greatest access
- Urban peripheries are facing food access challenges
- Transit lines have a substantial effect on food access
- Bring together community groups and government to best address local concerns and situations

Policy considerations to improve access include:

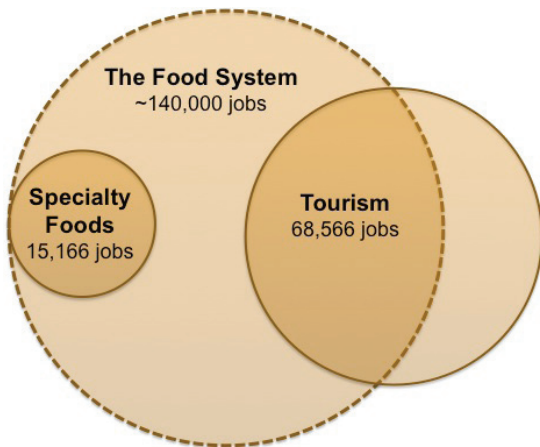
- Coordinate transit systems with food access points
- Educate riders on location of grocery stores
- Promote community level programs including farmers markets, community gardens, mobile food carts

This report is intended to serve as a starting point for future efforts to monitor and address food deserts in the region. The hope is for this work to be easily replicable as the Regional Food Policy Council moves forward with its *equity, health, and policy* goals.



WAGES

In order to advance the Regional Food Policy Council's *economic development* goal of supporting living wage jobs, this report seeks to understand the current state of food system employment. The production, processing, and retail sectors of the food system provide about 165,000 jobs in the central Puget Sound region in 2009. The analysis reveals that the majority of these jobs do not provide a living wage, which is the wage rate necessary to meet minimum standards of living. This report also presents key considerations for supporting economic development through the creation of living wage jobs in the food system as possible ways to address this challenge.



The number of jobs in various job sectors in the Central Puget Sound Region

Major findings from this report include:

- About 80 percent of non-farm food system workers earn wages below the lowest living wage standard used in this report (\$13.33 per hour, tips included).
- The lowest paid occupations are bussers as well as counter, cafeteria, coffee, and concessions servers. All make about \$9.25 per hour and number about 23,000, a significant share of regional food system employment.
- The highest paid occupations are purchasing agents and food scientists. Both make roughly \$29 per hour, though these occupations account for less than 0.2 percent of the 165,000 workers in the regional food system.

FOOD HUBS

This report provides guidance for policymakers and food systems stakeholders on food hubs, an emergent tool intended to sustain small and midscale farmers, to promote regional economic development, and to fulfill demands for locally and regionally produce food in a more efficient way. The U.S. Department of Agriculture's working definition of a food hub is "a centrally located facility with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/regionally produced food products."

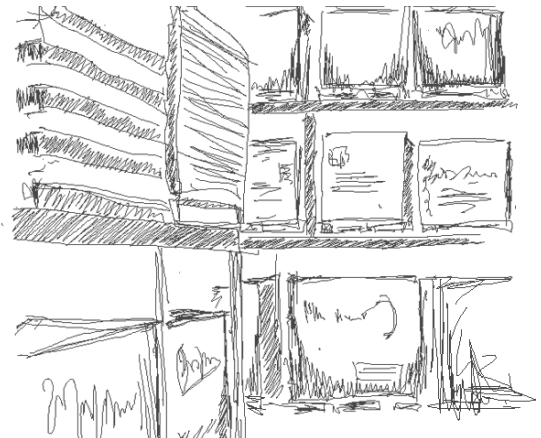
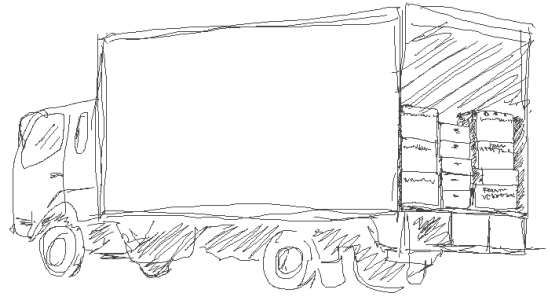
Food hubs may help advance the Regional Food Policy Council's *agriculture* goal by focusing on support for small and midscale farmers, which may in turn provide incentives to preserve farmland and improve the regional viability of farming. Food hubs may also help to advance the *economic development* goal by providing employment opportunities in the areas they serve and opening up access to new retail and wholesale markets that smaller farmers struggle to reach.

Major findings from this report include:

- Food hubs are gaining national momentum, as evidenced by U.S. Department of Agriculture's extensive and growing work on the topic in concert with local food systems organizations nationwide. More than 100 food hubs exist nationwide, averaging more about \$1 million in annual sales. More than half started within the last five years.

- Food hubs typically have three major components:
 1. wholesale aggregation/distribution,
 2. active coordination with food producers, and
 3. permanent facilities.
- Some food hubs provide additional services, such as space for wholesale and retail vendors, health and social service programs, community kitchens, and community meetings.
- Key considerations in starting a food hub include demand for locally and regionally produced food, creativity with funding, seamless systems for distribution and sales, careful market analysis, and review of policies to determine whether financial or regulatory incentives may aid food hub development.
- The planned Everett Farmers Market in Everett, Washington, which combines retail and wholesale sales of agricultural products, commercial kitchen facilities, distribution, education, and other elements, offers lessons for planning future regional food hub efforts.
- Two detailed case studies illustrate how food hubs have developed in two areas that share some of the central Puget Sound region's demographic and physical characteristics: the Local Food Hub, a non-profit food aggregator, distributor, and educational farm located in Charlottesville, Virginia; and The Wedge, a cooperative business with a retail store, distribution warehouse and educational farm located in Minneapolis, Minnesota.
- In recent years, all four counties in the central Puget Sound region have identified various barriers for smaller farmers, ranging from marketing and economic development to access to commercial kitchens to mechanisms for garnering wholesale clients. Food hubs may help to meet these needs while filling demonstrated consumer demands for locally and regionally produced food.

Core Food Hub Components:
Distribution, Warehousing and
Aggregation, Processing, and Retail Sales



POLICY

This report is intended to provide information to policymakers, food systems stakeholders, and advocates that can guide future action and policy development. The aim of this section is twofold:

- To increase communication, information-sharing, and education about policy work and policy opportunities region-wide
- To provide relevant model food systems policy language for use in support of the Regional Food Policy Council goals

As a whole, this report aims to advance the *policy* and *education* goals of the Regional Food Policy Council. First, this report summarizes policies contained in countywide plans that specifically address food system activities. Next, this report provides sample comprehensive plan and municipal code language for a variety of food systems activities. Jurisdictions can tailor these policies to their individual needs and situations. Then, this report discusses policies related to three food system topics: agricultural land preservation, food processing for economic development, and on-farm alternative energy production.

Major findings from this report include:

- There are small and simple policy changes that municipalities can make as a first step to enable food systems activities:
 - including food systems goals in comprehensive plan elements;
 - creating a streamlined permit for small farmers markets;
 - enacting food systems-supportive resolutions;
 - establishing farmers markets as approved land uses;
 - establishing community gardens as approved land uses or open space sub-districts;
 - enabling interim, temporary, or vacant land use agreements for community gardening or urban agriculture uses; and
 - establishing “healthy food zones” near schools.
- Agricultural land preservation policies are best understood in the context of a “package” of ten policy tools that work best when used in combination with each other. These tools are:

• Agriculture zoning	• Purchase of development rights
• Agriculture districts	• Right-to-farm law
• Comprehensive plans	• Transfer of development rights
• Conservation easements	• Urban growth boundaries
• Differential assessment of farmland	
• Private land trusts	
- Local food processing facility development and renovation can be enhanced by applying for and supporting the continuation of underutilized U.S. Department of Agriculture funding resources, such as the Community Facilities Fund.
- Encouraging government procurement of locally-grown foods increases processing demand by midscale farms as well as funding available for processing facility development (e.g. food hubs).
- Technical assistance and incentives can assist the agricultural community with undertaking renewable energy and energy efficiency projects.

ROAD MAP TO A GREENER RESTAURANT

Because the restaurant industry is a major component of the food system, it is important to consider the role of restaurants in achieving environmental, economic, and social goals. Developed in partnership with Seattle Chefs Collaborative, the *Road Map* provides guidance for new and existing restaurants on how to become more aware and responsive to sustainability issues. Users of the *Road Map* will find information and resources in six topic areas: food sourcing, water use, energy and the built environment, waste management, cleaning green, community and economy issues. The *Road Map* includes links to local resources that serve as supplementary material to the recommendations and incentives that the aforementioned categories offer. The completion of the *Road Map* signifies the first step in providing outreach to area restaurants; Seattle Chefs Collaborative will use the *Road Map* as the basis for future communication and marketing initiatives.

Major components of the *Road Map*:

- There are 35 self-assessment questions for restaurant operators covering the six topic areas. Examples of questions include “Do you compost food and other organic waste?” and “Do you use non-toxic cleaning products?”
- Each question contains at least two action items that restaurants can implement along with at least one resource, often more, that helps restaurants to think about sustainability. Examples of action items include giving food waste to farmers for animal feed and making your own non-toxic cleaning products.
- The *Road Map* provides region-specific resources, such as information about rebates offered by area cities, links to local harvest schedules, and local entrepreneurs who are involved with sustainable restaurants.
- The icons next to each question indicate at least one benefit—economic, environmental, or social—that can be achieved by taking the actions listed; many questions have multiple benefits.



CONCLUSION

The common thread binding this project's eight distinct reports is attention to the Regional Food Policy Council's goals. The reports described above:

- provide new qualitative and quantitative data,
- identify social and economic implications of this project's work,
- offer policy ideas, and
- suggest needs for future work where applicable.

The intent is to provide information that will assist Regional Food Policy Council members as they work toward their vision and mission of developing “just and integrated policy and action recommendations” toward a “thriving, inclusive and just local and regional food system.” The reports can stand alone and need not be read in any particular order. However, reading the entire set can provide an understanding of challenges and opportunities in the food system that is as diverse as the central Puget Sound region itself.

View the studio team's full reports at <http://courses.washington.edu/studio67/psrcfood>.

INTRODUCTION

The regional food production history subgroup developed a method for exploring the encroachment of development onto agricultural lands in the region. The goal of the methodology (which is discussed below) was to visually illustrate and communicate the degree to which rural lands had been subsumed by urban and suburban sprawl in the four counties.

In the past, agriculture comprised a significant portion of the economy in the Puget Sound region. However, development pressure, in conjunction with several influential federal, state, and local policies that impact land use policies significantly changed the landscape. One of the largest state policies influencing growth in the region was the Washington State Growth Management Act of 1990. Among many requirements, this act required communities that fit certain characteristics of size and potential to absorb growth to plan accordingly and do the necessary work to ensure preservation of critical undeveloped space. The act also established a region-wide Urban Growth Boundary, constraining growth and forcing the area's expanding metropolitan centers to rethink the way in which they address new development.

In the Washington State Growth Management Act (GMA), counties and cities are encouraged to use a variety of innovative zoning techniques to protect agricultural lands and encourage that sector of the economy.¹ These zoning techniques are put into action with the special designations for protected agricultural land counties have employed since the passage of the GMA in 1990.

The goal of this project, detailed in the methodology section, was not to illustrate current agricultural conditions – see this report's sections on rural and urban agriculture for those analyses. Rather, this section visually communicates the result of fundamentally unrestrained growth between World War II and the implementation of the GMA. It also includes a visualization of the current result of this policy level work.

METHODOLOGY

The group explored each of the four counties' agricultural lands policies in their respective comprehensive plans to identify lands singled out as both being essential for food production and threatened by the encroachment of development. For example, King County's 1994 Comprehensive Plan update, to reflect the goals of the GMA, designated Agricultural Production Districts (APDs): areas specially designated for the protection of farms, forestry, large lots, and open spaces.² Similarly, Pierce County (the region's second most populous county) currently designates its protected farming lands with the term, Agricultural Resource Lands (ARLs) and designates them through a combination of soil sampling, assessment of current land use, and data from the county's assessor-treasurer.³

Though the methods used by each of the counties (Kitsap pending) are different, they all have a rough equivalent of the kinds of districts described above. Their methods reflect the specific conditions and priorities of the counties' land regulations in determining what areas to protect to ensure a long-term agricultural presence within their jurisdictions. However, they are all results of efforts to protect agricultural land through county comprehensive plan updates, influenced by the GMA.

Having selected areas of particular interest (indicated by the presence of each of the counties' protection districts and characterized by similar urban growth patterns over the years), the history subgroup compiled and merged historical photographs, assembled from the University of Washington's map and aerial photograph collection, of these areas to demonstrate methods. Among these areas are the Kent Valley in King County, the Puyallup River Valley in Pierce, and the lowlands to the east of Everett in Snohomish County. As mentioned earlier, Kitsap County has not officially designated protective agricultural districts similar to the other counties as of yet. Overlaid onto a map of the region, the observer can see the effect of political decisions over the years on our region's agricultural lands and the resulting advance of development on what was historically open space, farming, and similar land uses.

The subgroup's methodology consisted of compiling GIS data from each of the four counties in the PSRC region highlighting their respective areas designated exclusively for agriculture. King, Pierce, and Snohomish Counties have all formalized these designations into their zoning and future land use maps. Kitsap County, while having designated rural protection zones, has not yet created special agricultural districts with the same protections as the other three. That work is underway, and the county plans to designate its formal districts in 2012.⁵ King and Snohomish Counties' data was available for free through their website. Pierce County's data was provided by Brynn Brady of Pierce County's Planning Department and the PSRC. Kitsap County's current zoning and land use data is available through their county website.

All of this data was initially compiled onto a map of the entire four-county region. Because each county used different methods for designating its agricultural districts,

the spatial form of the districts is strikingly different among them. While King and Snohomish counties used visual surveys, the boundaries of their districts are large and encompassing, bounding critical agriculture areas in large, comprehensive swaths. Pierce County used GIS and surveyor data to create a model to identify critical agricultural lands based primarily on soil quality.⁵ This resulted in their critical areas (i.e., Agricultural Resource Lands, or ARLs) being displayed in a very piecemeal, checkerboard pattern, quite a contrast to King and Snohomish. This map clearly displays the difference in results from contrasting methods for identifying critical agricultural lands from one county to the next.

With the four-county map fully arranged, the subgroup went about collecting historical aerial photographs from different time periods from the University of Washington's Map Resource Library. The first set of photographs selected was from a 1944 aerial survey conducted by the US Army Corps of Engineers. This was the earliest set of photographs the group was able to assemble in a comprehensive manner. The mid-1940's represents an era on the cusp, just before the post-war boom of highway and housing development.

The next year the group determined critical was within one to two years of 1990, the year the GMA passed. Imagery from 1989 was available for King County, and a 1991 orthophoto collection was available for Snohomish County. The most comprehensive imagery for the Orting study area in Pierce County was available only for 1994. Though this set was collected four years after the passage of GMA, this still precedes the designation of ARLs by Pierce County and therefore suits the purpose of the study.

- The most extensive examination of an area occurred with our Kent Valley study area, where the group was able to acquire aerial photography from the 40's, 80's, 90's, and the 2000's. From these maps, one can see – in detail – a pattern of growth since the end of World War II until present day that is sprawling in pattern and invasive onto lands previously used for agriculture, open space, forestry, and similar uses. The following collections of orthophotography were examined: 1944 US Army Corps of Engineers Aerial Photo Collection for all counties
 - 1989 – SP-89 Aerial Photo Collection for all counties
 - 1991 – NW-91 Aerial Photo Collection for Snohomish County
 - 1994 GeoCD for Orting
 - 2001 – NW-C-201 Aerial Photo Collection for all counties
 - 2002 US Geological Survey color orthophotos for all counties
 - 2006 US Department of Agriculture National Agriculture Imagery Program collection for all counties.

Additional details about each of these photography datasets can be found at the University of Washington Library website:

<http://www.lib.washington.edu/maps/MapResources/airphotochart.html>.

The subgroup selected similar regions in the three counties that both contained designated agricultural areas via zoning (i.e., APDs, ARLs, etc.) and have been on the

fringe of urbanization since the 1940s. Study areas were between 15 and 20 square miles and generally along river-agricultural valleys which had predominant agricultural land cover in the 1944 data set. The study areas were: the Kent-Auburn valley in King County along the Green River, Orting and northwards in Pierce County along the Puyallup River, and between Everett and Lake Stevens in Snohomish County along the Snohomish River. Selecting areas in Snohomish and King Counties was facilitated by the relatively large and contiguous areas of designated agricultural lands. For Pierce County, an area with a large concentration of smaller ARLs was selected.

The criteria for selecting a study area required first and foremost that the site be within an agricultural protection district (or the respective county's nomenclature for the districts). Next the area needed to be located within five miles of a growing, medium sized city with suburban expansion. The area – designated by the protection district – also needed to be within five to ten miles of a limited access highway (i.e., interstate or state highway). The group decided on medium sized cities like Puyallup/South Hill, Kent, and Everett, rather than central cities (Everett as somewhat an exception, being both medium sized in terms of comparison to other regional cities, yet central in terms of its relationship to Snohomish County), because agricultural land encroached upon by urban sprawl proved to be more difficult to locate and document around cities like Seattle and Tacoma, especially since most of the sprawling, low density growth is currently occurring on the suburban fringe.

Georeferencing the aerial photography over the projected GIS data, our group was able to visually estimate of the amount and pattern of agricultural land change over time around districts determined by the counties to be land worth protecting based on either historical local farming practices or soil sampling and assessor data. These maps are included at the end of this section.

This visualization makes evident the patterns of growth around agricultural lands determined to be at risk and worth saving. It can inform policy decisions on both the effectiveness of their efforts to protect their respective agricultural lands, and perhaps make a judgment about the cohesiveness of their methods, and the resulting effects of curbing growth in each of their counties' high demand areas, when projected next to each other. These visualizations can also be used to determine how well the boundaries are working and whether they require modification. For instance, if urbanization reaches completely to the boundary edge, then one can at least determine that the special zone is functioning. If we see a reverse trend of de-urbanization (e.g., inside the boundary of the protected zone in the Snohomish maps between 1991 and 2002), then one may be able to draw the conclusion that the districts are providing an even greater payoff than previously assumed. If there remains more space for potential agricultural lands around the protected zone, then a debate about possibly expanding the zone's coverage may be warranted, depending on specific county growth pressures and political circumstance. Finally, these visualizations can point to the problems or benefits of each county's designation methods themselves, based on their spatial patterns and the resultant effected development around them.

RESULTS AND DISCUSSION

The findings of the subgroup, through this mapping and georeferencing exercise, were twofold. The obvious conclusion that agricultural lands throughout the four county region have been in a state of serious recession over the last half to three quarters of a decade. This is evident when examining the large, low-density patterns of urban sprawl in the historic photographs.

These maps highlight areas of the counties where agriculture has survived over the years. Several patterns emerged, and these zones have a degree of spatial continuity through the region, particularly along river ways. Although the zones tend to match up in the sense of making a relatively cohesive pattern, the methods for designating those particular districts from county to county was a disjointed process that leaves room for speculation as to which method is or was the most effective. King and Snohomish relied largely on visual surveys and current land uses and this methodology is reflected in the generally cohesive and interconnected nature of their agricultural zones. Pierce's method was, apparently, more scientific and quantitative in nature, relying on scientific soil data and assessor's numbers to determine appropriate lands, parcel by parcel. While the less scientific method seems to have yielded more contiguous spatial pattern, the more data driven method seems to have created a checkerboard pattern that may, in the long run, be more defensible. It could also be argued that a thriving agricultural system needs larger, connected tracts of land in order to maintain production and profitability, and the parcel-by-parcel method may leave room between the protected zones for other land uses.

Based on the assumption that a comprehensive special agricultural district zoning policy may not occur between now and when Kitsap County finishes its designations, when the county goes through that process, does the results of this study should be considered as county leaders decide on specific methods. The decision of whether to designate lands like Snohomish and King Counties, like Pierce, a hybrid method of the three, or an altogether different strategy more appropriate for Kitsap County is a decision that should be determined after extensive consideration of the merits of each method.

As one can see in table 1 below, Pierce County has close to half the agricultural

Table 1: Designated Agricultural Lands by County

County	Acres
King	64,466
Pierce	31,111
Snohomish	62,739
Total	158,315

Table 2: Designated Agricultural Lands by Designation Type

County	Zoning Designation	Acres
King	Corn	827
King	Forested, Upland	23502
King	Grapes	7
King	Livestock, Forage	16262
King	Managed Field, Grassland	2314
King	Market Crops (Produce)	2314
King	Marsh or Wetland Preserve	951
King	Nursery	444
King	Orchard	170
King	Other (roads, buildings, water bodies, buffers, etc.)	10133
King	Sod Farm	381
King	Sports, Recreational	571
King	Too wet to farm	423
King	Topsoil Production	4
King	Tree Farm	629
King	Unknown	1873
King	Unmanaged	3623
King	Unmanaged Orchard	36
Pierce	RF	8061
Pierce	ARL	23050
Snohomish	UHORT	183
Snohomish	LCF	3613
Snohomish	UCF	641
Snohomish	RCF	58302

designated areas as its peers. This is partially due to the fact that much of the rural land in the county is occupied by Mount Rainier National Park. This should be taken into account when examining the methods and amount of land protected by Pierce County. Table 2 breaks down the various categories used by each county for their designations. When examining this, it is important to keep in mind that, while some categories appear similar, their actual uses can be quite different from county to county.

Careful attention was paid to the years around and after the implementation of the GMA. The group deemed it critical to scrutinize development thereafter because of the new policy and its comprehensive nature of influencing growth in our region in a large and comprehensive manner.

The history subgroup, working closely with the rural agriculture subgroup, has concluded that a larger scale method of determining critical lands in the four-county region is necessary. Questions still remain about these zones as policy tools and the effectiveness of one method over another, since they all appear to have the same effect of keeping development out of critical and pressured areas. Issues of spatial form and criteria for designation of lands remain as well

for exploration of best methods. It should be noted that these zones are alterable only through county comprehensive plan updates, which should reinforce their strengths as solid, effective policy tools. As a recommendation for the future of these zones, a region-wide benchmark test, drawing from the strengths of all the multiple counties' processes could be an invaluable tool for both assessing critical lands that are part of our region's agricultural economy. This test could also create some degree of cohesion between political boundaries to ensure that the resulting map of protected lands is truly comprehensive. In the same way that watersheds are governed across political boundaries to ensure that methods and protections are the same, regardless of area, this system (i.e., more economic than natural) can have the potential for a similar level of cohesion between partners all involved in protecting and strengthening a segment of our economy vital for the economic strength and diversity, as well as the historical importance, of our region.

NOTES

1. Washington State Legislature. "Chapter 36.70a.177 RCW Growth management — planning by selected counties and cities ." *Washington State Legislature*. 1990. <http://apps.leg.wa.gov/rcw/default.aspx?cite=36.70a&full=true#36.70A.177> (accessed May 20, 2011).
2. King County. *Water and Land Resources Division*. May 26, 2011. <http://www.kingcounty.gov/environment/wlr/sections-programs/rural-regional-services-section/agriculture-program.aspx> (accessed May 30, 2011).
3. Brady, Brynn, interview by Cameron Duncan and Lisa Sturdivant. *Pierce County Planner 3, Advanced Planning Division* Seattle, WA, (May 10, 2011).
- 4 Kitsap County Board of Commissioners. *Kitsap Food Chain*. 2009-2011. <http://kitsapfoodchain.org/wp-content/uploads/2011/03/RuralElements031311-JD.pdf> (accessed April 15, 2011).
5. Brady, Brynn, interview by Cameron Duncan and Lisa Sturdivant. *Pierce County Planner 3, Advanced Planning Division* Seattle, WA, (May 10, 2011).

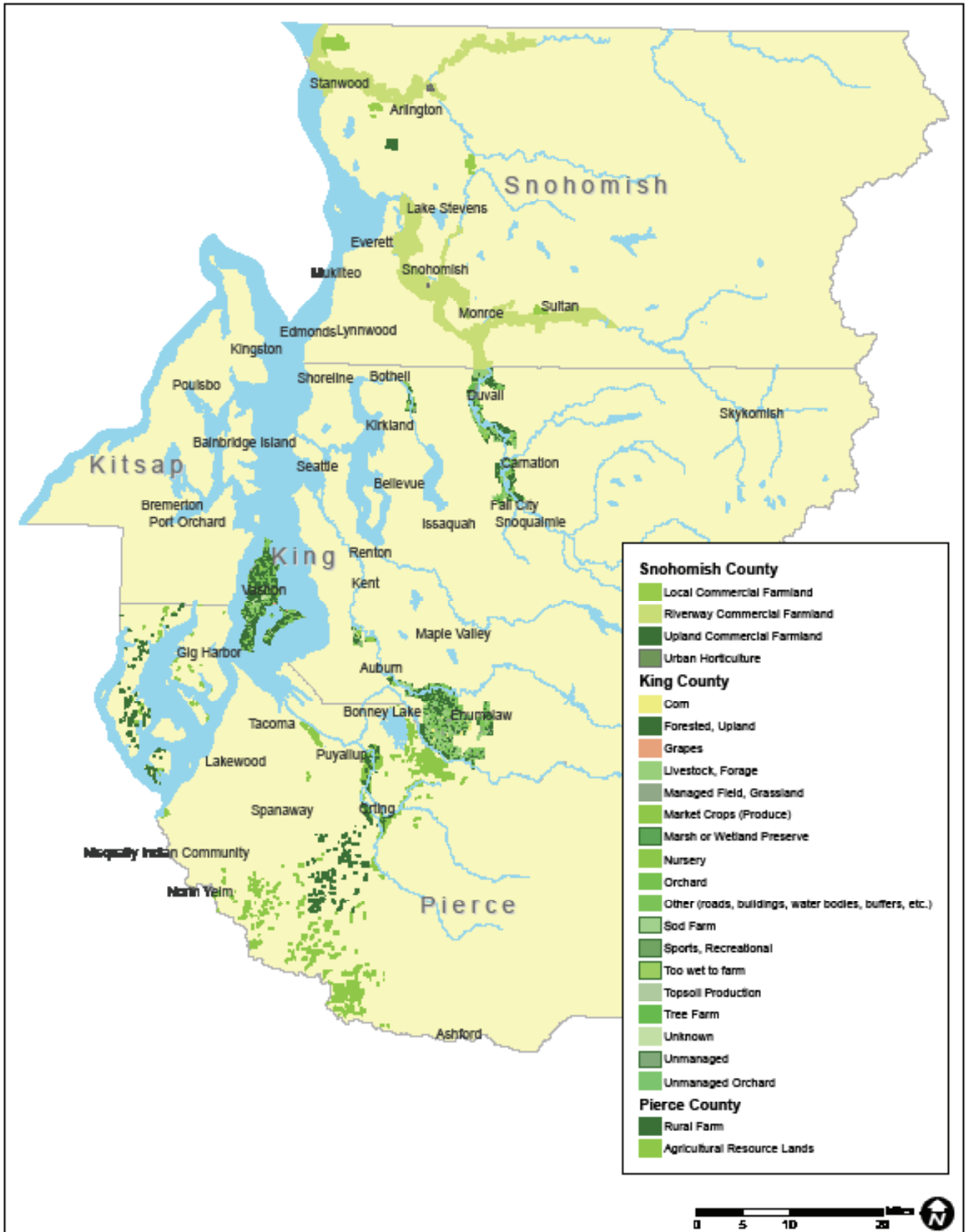
FOUR COUNTY MAP

PROTECTED AGRICULTURAL ZONES



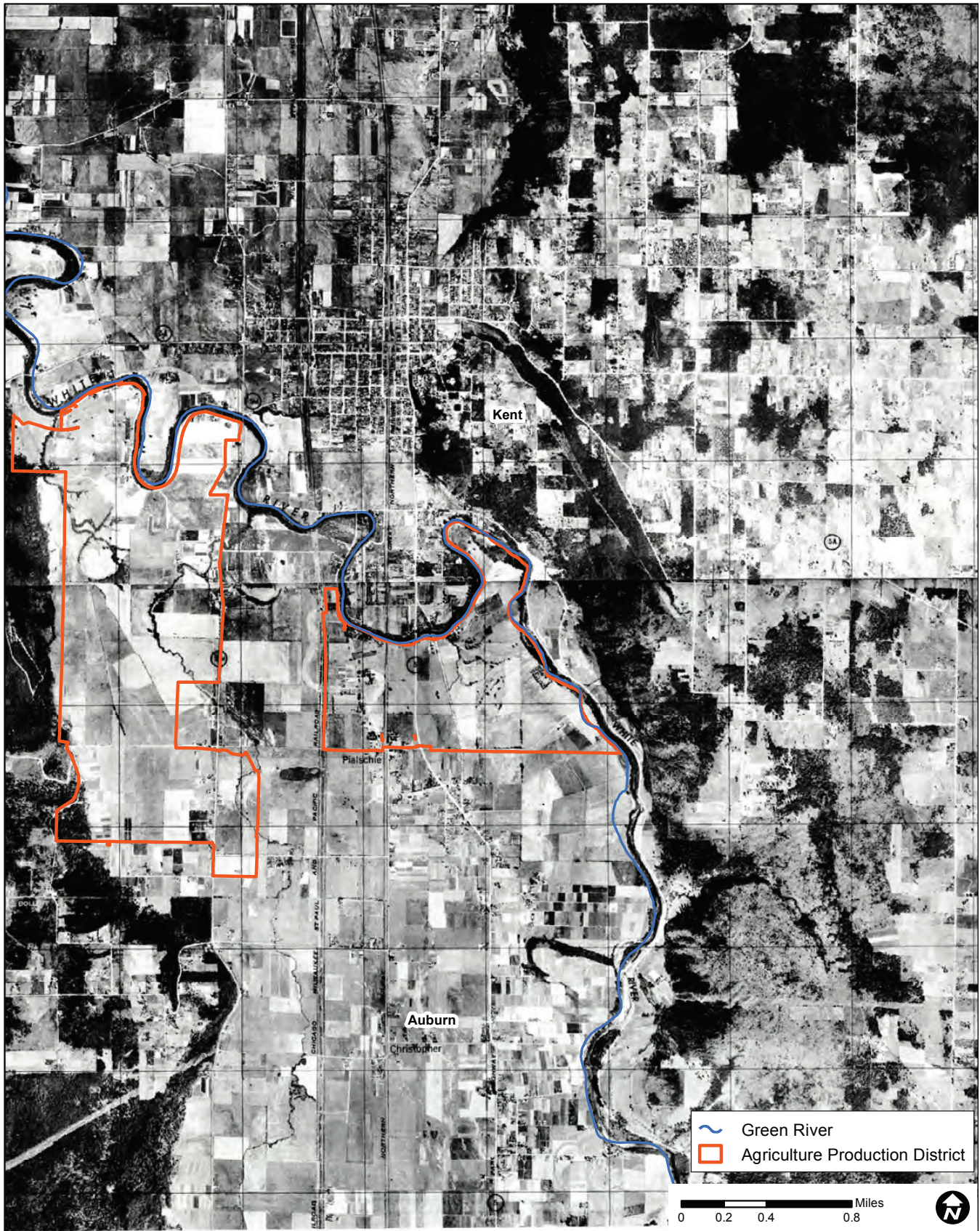
FOUR COUNTY MAP

PROTECTED AGRICULTURAL ZONES BY SPECIFIC LAND USE DESIGNATIONS



KING COUNTY - 1944

KENT VALLEY



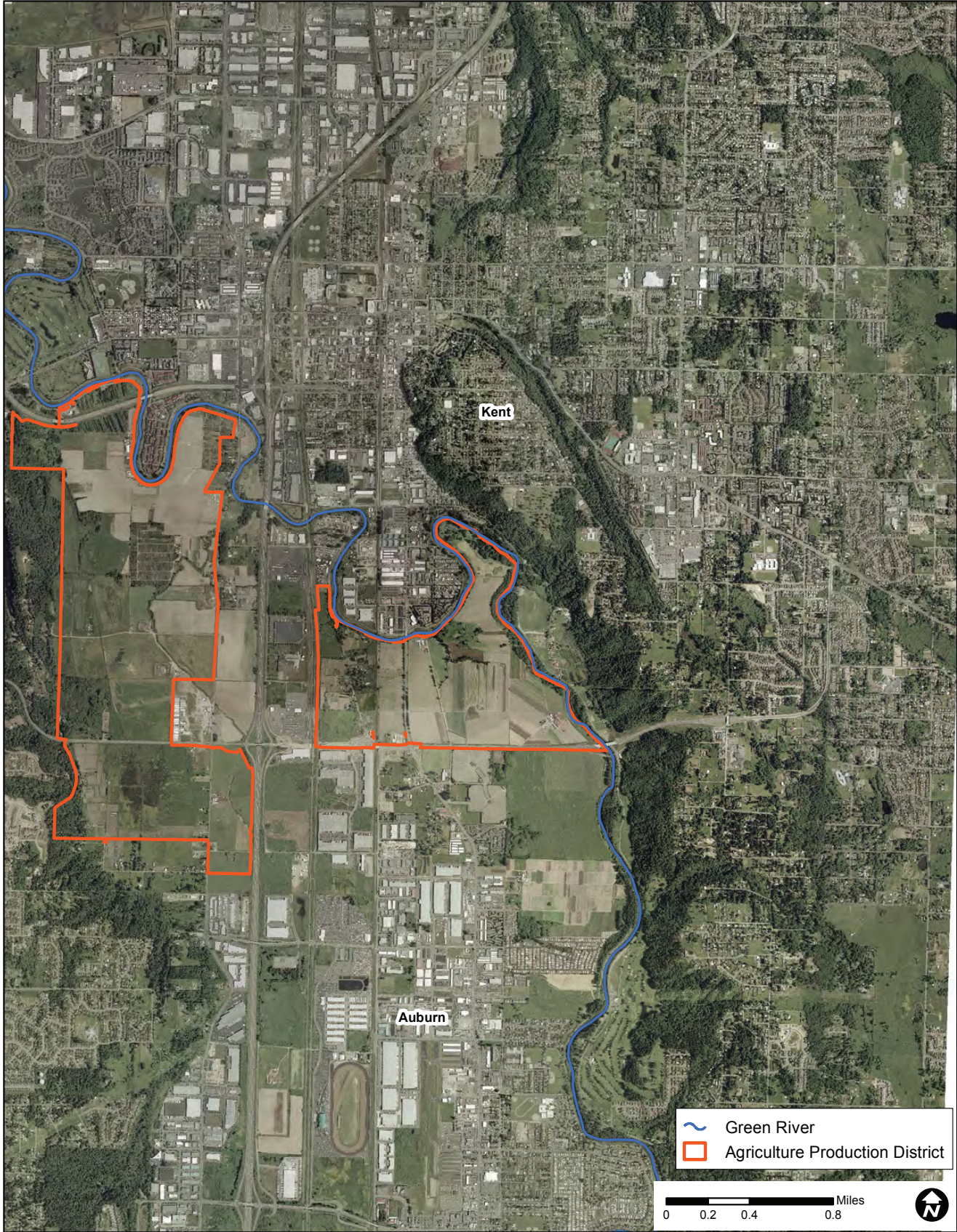
KING COUNTY - 1989

KENT VALLEY



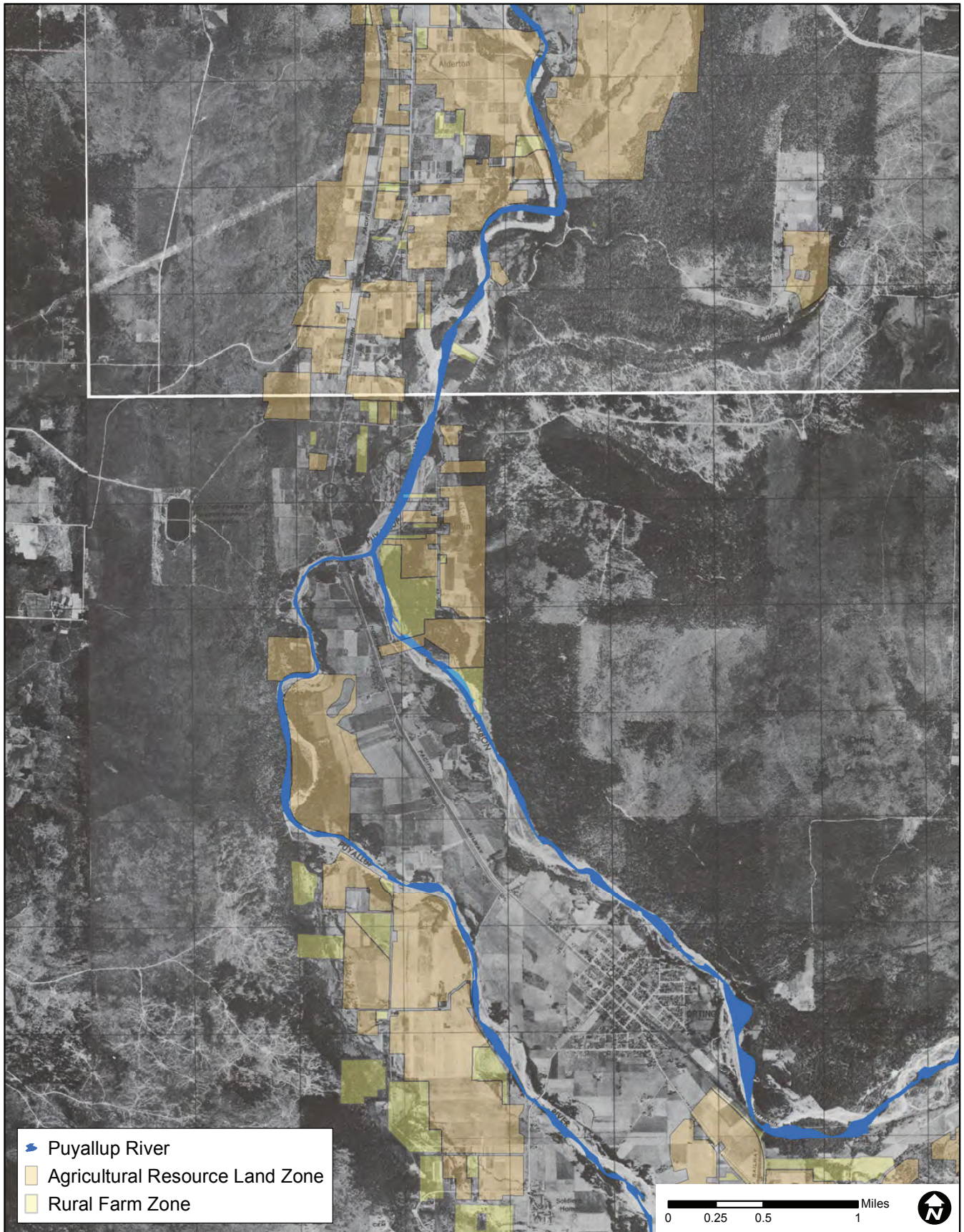
KING COUNTY - 2002

KENT VALLEY



PIERCE COUNTY - 1944

PUYALLUP RIVER VALLEY



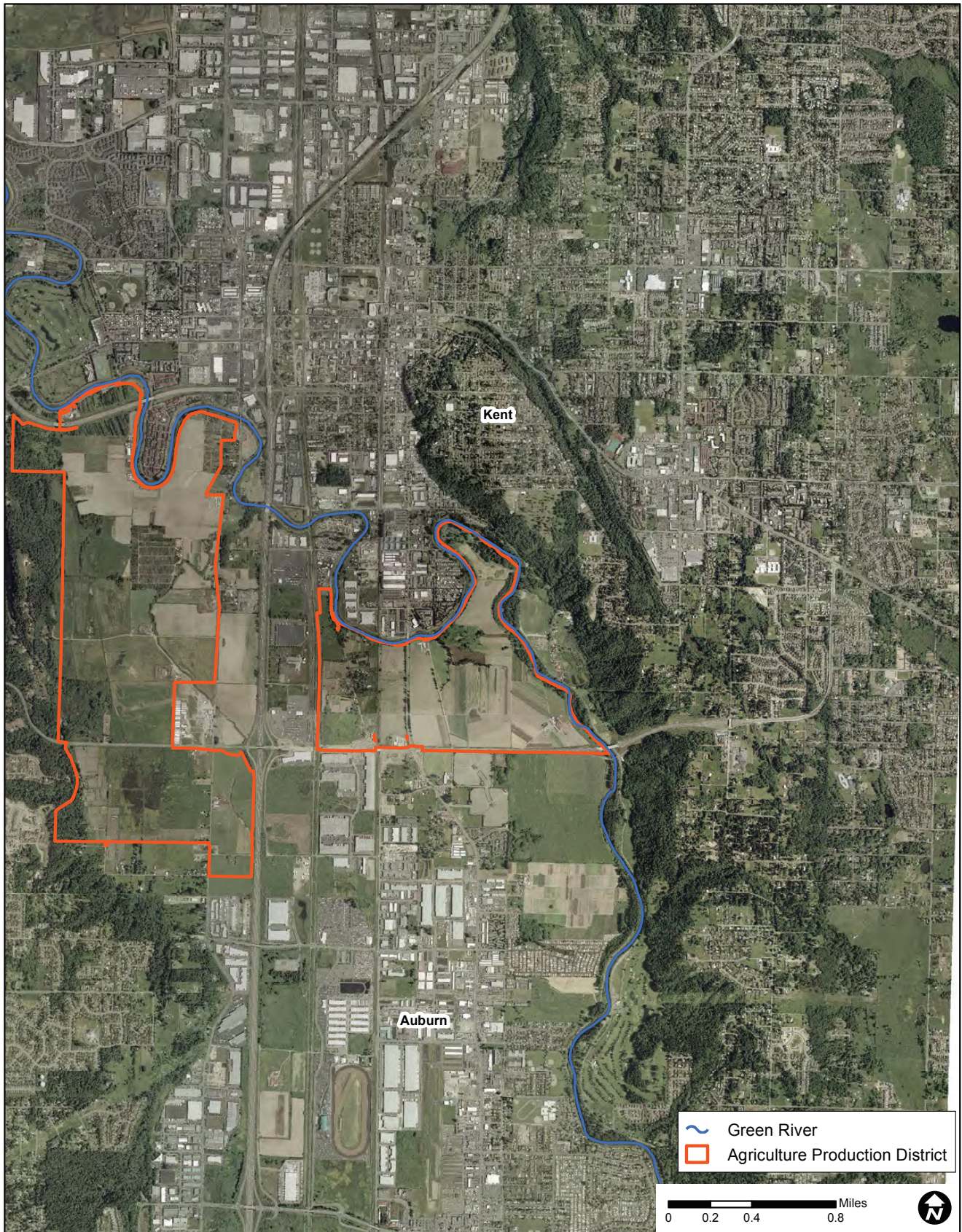
PIERCE COUNTY - 1994

PUYALLUP RIVER VALLEY



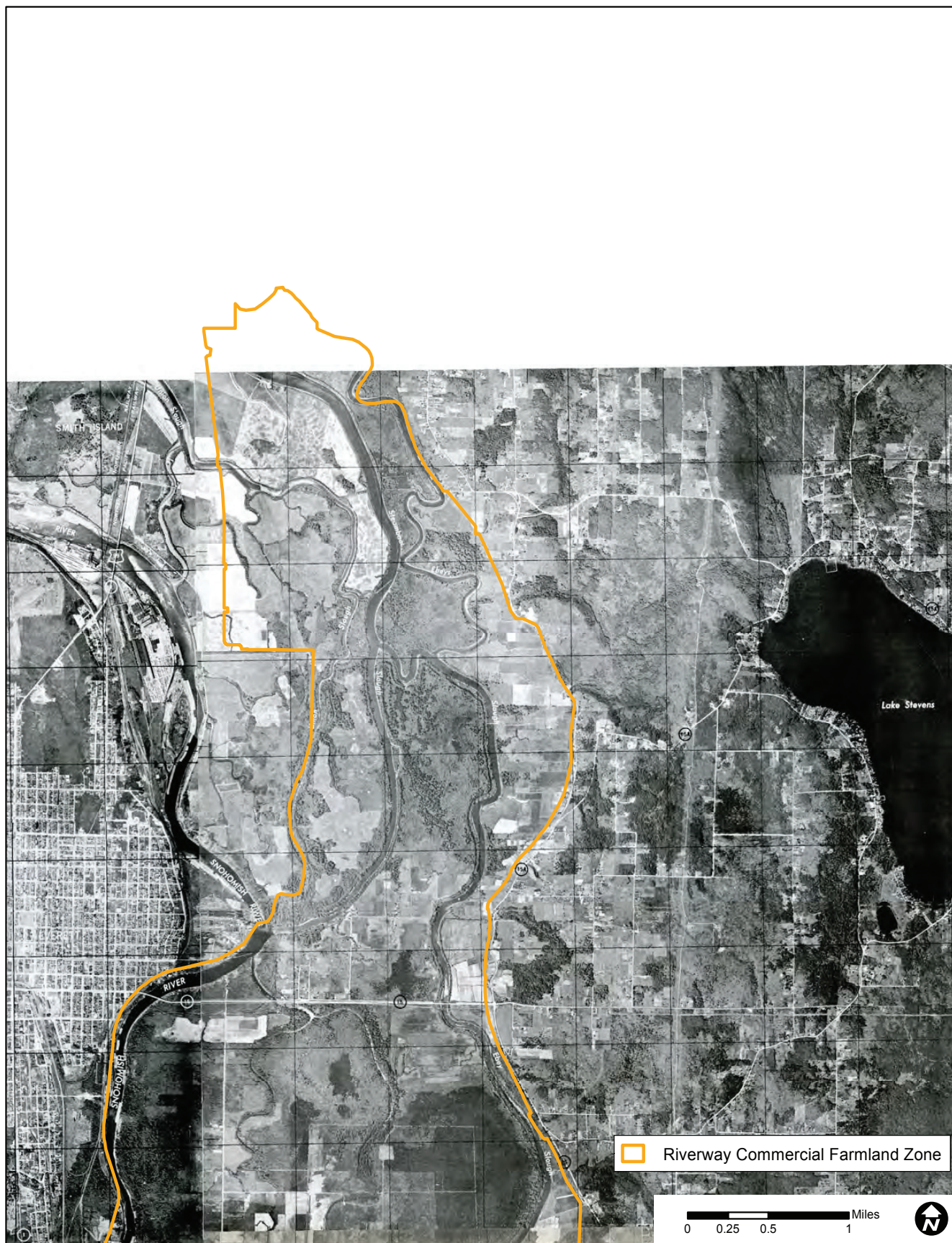
PIERCE COUNTY - 2002

PUYALLUP RIVER VALLEY



SNOHOMISH COUNTY - 1944

SNOHOMISH RIVER VALLEY



SNOHOMISH COUNTY - 1991

SNOHOMISH RIVER VALLEY



SNOHOMISH COUNTY - 2002

SNOHOMISH RIVER VALLEY

