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CC: ARL Project Team

DATE: July 1, 2016 – Revised 7/21/16

SUBJECT: A Fresh Look at Pierce County Agriculture
Technical Memorandum #7 – Evaluation of Pierce County’s Current ARL Criteria

Introduction

A multi-disciplinary team led by Barney & Worth, Inc. is taking *A Fresh Look at Pierce County Agriculture*. Members of the team bring extensive agricultural, scientific, legal, and economic expertise to the project.

The Washington State Growth Management Act (GMA) requires counties to designate Agricultural Resource Lands (ARL), which “have long-term significance for the commercial production of food or other agricultural products”. Pierce County places a high priority on protecting commercially viable agricultural lands, and has established these criteria for ARL parcels:

- Located in rural area of County (outside UGA)
- Five acres or greater
- Contain at least 50% “prime farmland” soils
- Grass/legume production yield of 3.5 tons per acre or greater
- 50% of abutting parcels larger than 1 acre
- Landowner may request the designation

The consultant team is analyzing the current condition of Pierce County’s agriculture sector and evaluating the effectiveness of the County’s zoning regulations for protecting agricultural lands. The County’s current ARL criteria will be revisited, with consideration given to alternatives. A series of technical memoranda are being prepared to illuminate different aspects of farmland protections.

This technical memorandum reviews each of the six elements of the Pierce County’s current designation criteria for the ARL zone. The memorandum begins with a summary evaluation. Then significant strategic questions are addressed. This provides background needed for consideration of changes in ARL designation later in the study.

Highlights

The key highlights of this analysis:

- The six criteria used for ARL designation are compliant with GMA requirements.
- Instead of adopting one set of uniform county-wide designation criteria, the possibility of establishing sub-county agricultural districts offer potential to address the wide differences in viable crop and livestock production activities across the county.
- Available methods to measure, rate or compare potential soil productivity are not very useful because of differences in production requirements for different crops.
- Pierce County’s current designation criteria allow for relatively small minimum parcel sizes (5 acres) and small-sized abutting parcels which results in hundreds of separate, scattered ARL zones across farm country.

Initial Review of the Current ARL Criteria

Pierce County established its current ARL designation by applying six criteria consistently across agricultural territory rather than setting different criteria for the various districts based on the unique local crops and agricultural production requirements. The details of each current ARL criterion are summarized in Table 1 on the basis of:

- Compliance with the Growth Management Act (GMA) and the Washington Growth Management Hearings Board (WGMHB) decisions;
- Whether other Washington counties use it;
- Whether data are available to measure it adequately; and
- How local stakeholders perceive it based on recent interviews.

The following sections analyze Pierce County’s six current ARL criteria in light of these key questions. GMA provides counties with the option of varying the application of ARL criteria in different agricultural districts at a sub-county level, which is an approach used in some counties (e.g., Walla Walla and Snohomish Counties).

Table 1: Evaluation of Pierce County's Current ARL Criteria

Current Pierce County ARL Designation Criteria	Complies with GMA/ WGMHB	Used in Other Counties	Data Available	Possible to Vary by District	Stakeholder Feedback
Located in a rural area (outside UGA)	✓	✓	✓		Workable – but UGA boundaries change
5 acres or Greater	✓	✓	✓	✓	Is 5 acres too small? Should contiguous parcels be considered?
Contains at least 50% prime farmland soils	✓	✓	✓	✓	No consensus on definition for prime farmland soils Greenhouses/other production doesn't require prime soils 50% is arbitrary; too high for larger sites
Grass/legume yield of 3.5 tons or more per acre	✓		✓		Arbitrary, unique, outdated, and confusing – not based on real productivity or Pierce County's typical crops. 3.5T/acre is not a high standard
50% of abutting parcels larger than 1 acre	✓	✓	✓	✓	1-acre limit seems random, too small
Landowner may request designation	✓	✓	NA	✓	"Anybody should be able to designate their land ARL"

Stakeholder feedback is from the database of responses to the stakeholder survey conducted by Barney & Worth, June 2016.

Location Outside Urban Growth Areas

Pierce County specifies that ARL land must lie outside of an Urban Growth Area (UGA). This is consistent with the Washington Administrative Code guideline that agricultural resource land be uncharacterized by urban growth.¹ This criterion is used consistently across the state, although some counties use different language to achieve the same result, for instance, by further requiring the ARL land be located outside of a sewer service boundary. GIS data showing UGA boundaries is readily available, so determination down to the parcel level is an easy exercise for the County. This criterion could also be applied comparably for different agricultural districts. According to interview findings, stakeholders are broadly satisfied with this rule. They note that UGA boundaries change over time, but in fact they change very infrequently and only after a comprehensive public review process. Still, loss of prime agricultural land to the UGAs has been perhaps the greatest challenge to preserving farmland in the county.

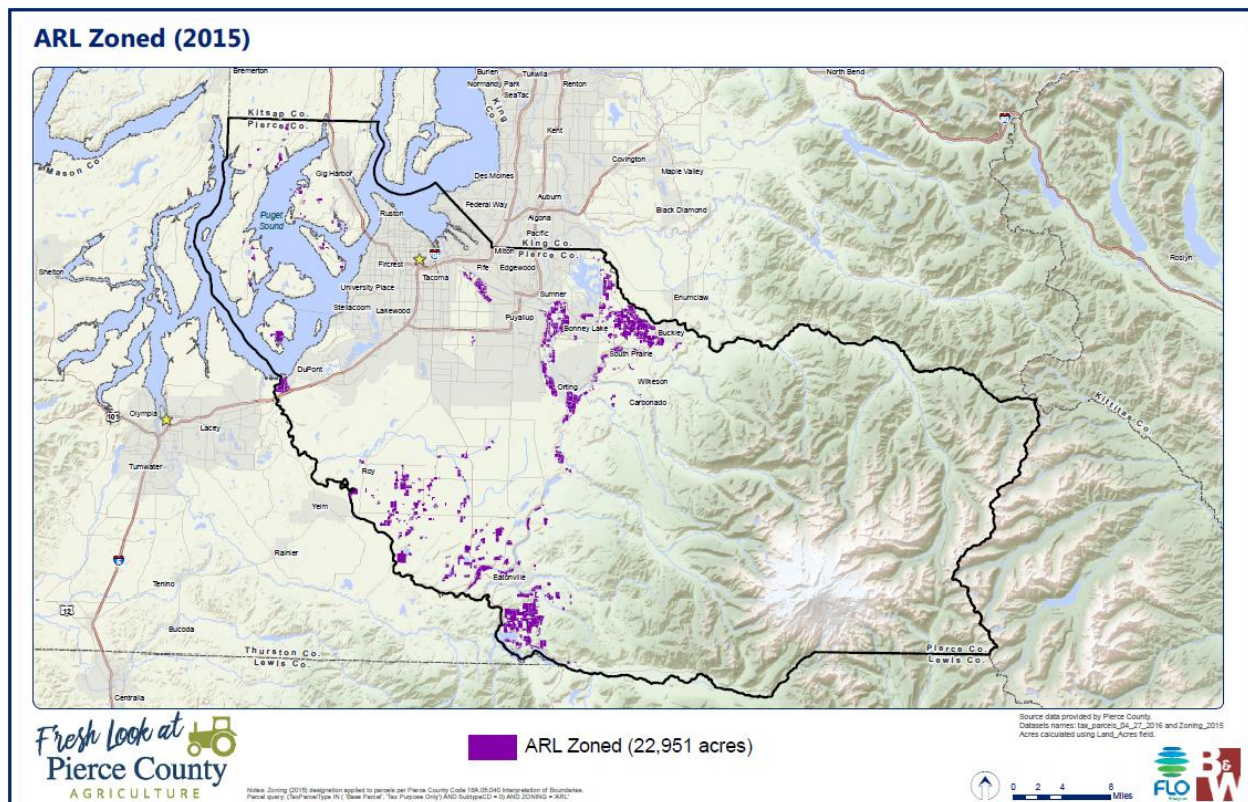
Five Acre Minimum

Parcels 5 acres and larger may be designated as ARL in Pierce County. Consistent with GMA, most counties in the state consider parcel size in determining whether land has long-term commercial significance for agriculture, and 5 acres is the smallest minimum parcel size classification used in the state. By using a 5-acre minimum parcel size, Pierce County has recognized the important trend of decreasing farm size in its territory and across western Washington. Provided that other suitable conditions exist (e.g., well-drained, high quality soils), commercial agriculture can be maintained on small land areas. While Pierce and Skagit Counties are at the extreme (small) end of the statewide range, other counties with urbanizing areas are also responding to the changing face of agriculture by adopting small minimum ARL lot sizes. For instance, Clark County is considering reducing its minimum ARL parcel size to 10 acres from its current 20 acres. Walla Walla County has defined an “Agriculture Residential” zone near the urban edge which allows for a 10-acre minimum parcel size. The stakeholder interview process did surface some concerns with the 5-acre minimum parcel size. Some stakeholders are concerned this might be too small, and others believe the existence of contiguous parcels should also be considered in meeting the minimize acreage criterion.

GIS analysis demonstrates there are a large number of separate ARL zones distributed across Pierce County. ARL-designated land currently exists as approximately 305 separate clusters of parcels, with nearly 75 percent of these clusters comprising one to three parcels. Many small “islands” or “peninsulas” of ARL land exist in the midst of conflicting non-resource land uses. The lack of logical boundaries to the ARL designation and the high potential for conflict with other land uses likely detracts from the economic viability of the agriculture sector in the county over the long-term. The non-contiguous clustering of ARL land is readily seen in Figure 1.

¹ WAC 365-1900-050(3)(a). This is discussed in Technical Memorandum 2, page 4.

Figure 1 – Pierce County Agricultural Resource Lands (ARL) – 2015



Prime Soils at 50 Percent

The classification of prime farmland soils as mapped and defined by the USDA Natural Resources Conservation Service (NRCS) is the most commonly used criterion for identifying agricultural lands of long-term commercial significance for GMA compliance in western Washington. In fact, this criterion is frequently used by land use authorities across the nation. Pierce County uses this criterion for its ARL designation, requiring that at least 50 percent of each designated parcel contain prime farmland soils. County officials consulted Chuck Natsuhara, NRCS Area Resource Soil Scientist, to identify 34 prime farmland soils in Pierce County for use in ARL designation. The USDA defines prime farmland as land having "the soil quality, growing season, and moisture supply needed to produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management."

Some prime farmland soils require that a specific limitation or hazard be properly managed. For example, some prime farmland soils are prime only if drained and either protected from flooding or not frequently flooded during the growing season. Others are prime only if irrigated. The prime farmland soils used in determining Pierce County's ARL designation include those having these limitations, which can be overcome by applying standard "best practices" farming techniques.

It is difficult and costly for County staff to objectively determine if the limitations to prime farmland have been or can be removed by a particular landowner. Furthermore, requiring that the limitation be removed is likely not a relevant consideration for GMA compliance, as the owner's intent can be used to

designate ARL but not to de-designate. In other words, assuming that a farmer does not intend to irrigate an ARL parcel having soils that are prime only if irrigated would not be a defensible reason for de-designating that parcel.

Soil Survey maps and classifications are very useful, but are also imperfect and dynamic, thus Soil Survey information should be used together with other criteria to designate ARL parcels. First, any soil map unit can have inclusions of up to 50 percent of other soil types, thus a prime farmland soil map unit may contain up to 50 percent of non-prime soils. All soil map units were originally farm management units meant to assist a farmer in identifying larger areas where particular soil types dominate. The farmer would typically manage most of a map unit area similarly, but would also make site-specific decisions about changing management or avoiding certain areas not suitable for farming. Secondly, the Web Soil Survey is regularly re-assessed and re-correlated at a state and national level. Although changes over time tend to be minor, Soil Map Unit descriptions and Land Use Classification designations from the original hard copy Soil Surveys and from earlier digital Soil Survey data revisions will change without notice. Pertinent here, the June 1981 publication, ***Important Farmlands of Pierce County***, identified in the Pierce County Code provides an approximate extent of important farmlands based on a soil survey map published by the USDA in hardcopy form 1979. This is an outdated map, as the USDA's Soil Survey has been updated online, and therefore, perhaps this reference should be removed from the County Code. If needed, a comparable map can be created from the current, updated Soil Survey, which would replace this outdated reference.

Grass-Legume Yield

ARL designated land in Pierce County must contain soils having a grass-legume hay production yield of 3.5 tons per acre or greater without irrigation. This crop productivity data is sourced from the USDA Natural Resources Conservation District's Web Soil Survey, which provides yield estimates for a range of irrigated and non-irrigated crops. The weighted average yields provided by the USDA reflect the productive capacity of each soil for the selected crop, and are "based mainly on the experience and records of farmers, conservationists, and extension agents.... [as well as] data from nearby areas and results of field trials and demonstrations".² There are 18 non-irrigated crop types included in the Web Soil Survey for Pierce County, ranging from alfalfa to filberts, potatoes, raspberries and wheat. However, grass-legume hay is the only crop type for which yield estimates are provided for almost all soil series mapped in the county, making it the best option for comparing the relative productivity of different soils across the county.

Still, there are limitations to using yield data estimates for a single crop type to determine absolute agricultural productivity for a given soil, or even for comparing relative agricultural productivity between soils. This is because ideal soil conditions differ for different crop types. For instance, an optimum soil pH range for potatoes has a lower limit of 5.0, while the lower limit for alfalfa is 6.5.³ Two Pierce County examples illustrate this point. According to the Web Soil Survey, grass-legume hay is estimated to yield

² Web Soil Survey, Natural Resource Conservation Service, U.S. Department of Agriculture,

³ Oregon State University Extension manual, at <http://whatcom.wsu.edu/ag/documents/smallfruit/em8857-e.pdf>.

1.79 tons/acre on Semiahmoo muck and 4.57 tons/acre on Sultan silt loam, while sweet corn is estimated to yield 6.26 tons/acre and 4.57 tons/acre on those same soils, respectively. Thus, while Semiahmoo muck is relatively better for sweet corn production than Sultan silt loam, the inverse is true for grass-legume hay. In the second example, potatoes yield better on Snohomish silty clay loam (214.74 cwt/acre) than on Orting fine sandy loam (200.00 cwt/acre), while grass-legume hay yields better on Orting fine sandy loam (4.00 tons/acre) than on Snohomish silty clay loam (2.68 tons/acre). Pierce County recognizes that this criterion is not a reliable measure for evaluating the relative significance of different agricultural lands, and has pointed out that some of the best soils in the county do not meet the minimum yield standard.⁴ For the reasons explained above, it may be prudent to remove the yield-based criterion from the Pierce County ARL designation process.

Size of Abutting Parcels

Pierce County joins other counties in setting size thresholds for abutting properties, but Pierce County's standards allow for substantial non-resource land use around ARL land. An ARL parcel cannot be adjacent to lots of record of one acre or less on more than 50 percent of its perimeter. There are a number of issues that arise from the definition of this criterion. First, it is possible for significant residential land settlement, including small lot subdivisions, to surround up to half of an ARL parcel. These conditions attract urban services to the area and can hasten its transition from agriculture to non-agricultural residential and commercial uses. Second, the small minimum size requirement for parcels abutting ARL land combined with the small minimum size requirement for ARL land results in many "islands" and "peninsulas" of ARL land among non-resource lands. These conditions increase the chances for urban-agricultural conflicts. They also impede the ability of farmers to lease adjacent agricultural parcels that are of suitable size and quality, increasing the complexity and cost of farming. The discussion of extensive scattering of ARL land is discussed below and is shown on the maps that accompany this report.

Changing Pierce County's standard to require larger properties against the boundary of ARL lands would further the goal of maintaining and enhancing the economic viability of the county's agricultural industry. There may also be advantages to having a minimum cluster size for contiguous ARL parcels. But the change would also reduce the amount of ARL-designated land.

At least one other western Washington county allows for the flexibility to place parcels in an ARL zone that may not meet all of the designation criteria in order to provide logical ARL boundaries and to avoid the "islands" or "peninsulas" patterns that conflict with non-resource land uses. Similarly, parcels that meet some or all of the criteria could be excluded to provide logical boundaries to the Agricultural Resource lands designation and to avoid conflict with existing land uses. This flexibility could be beneficial to Pierce County.

⁴ Pierce County Staff report to Land Use Advisory Commission, March 2015, page 11.

Voluntary Landowner Designation

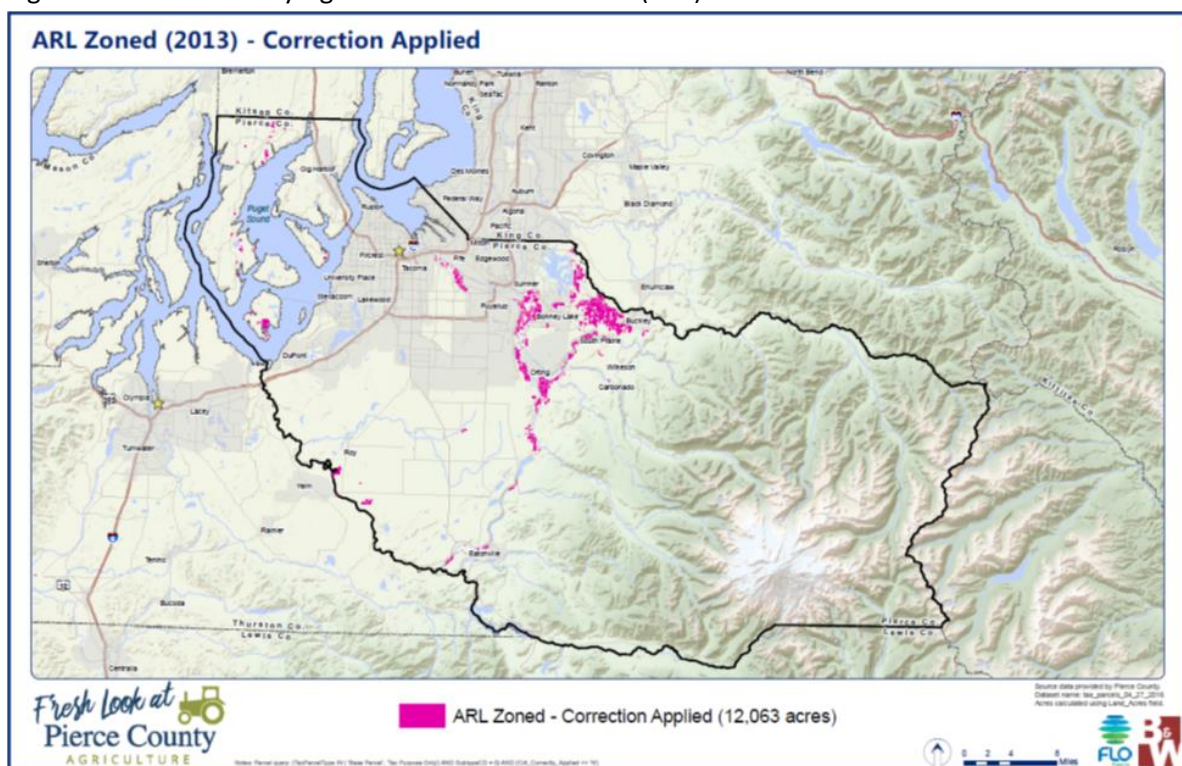
Several counties, including Pierce County, allow landowners to voluntarily designate their land with an ARL designation even if it does not meet the required criteria. It is permissible under GMA to allow landowners to opt-in to this resource land designation. While Pierce County has no established minimum criterion to accept the request, Snohomish County does. It could further the resource land protection policies of the county to have minimum conditions, such as adjacency to other ARL designated lands, or minimal parcel size criteria. There also could be advantages for landowners who currently have a property in Pierce County's Transfer of Development Rights program to also designate that property as ARL. In our interviews, stakeholders foresaw no issues with landowners voluntarily encumbering their land with an ARL designation. The County would not have difficulty identifying and tracking the voluntary designation after it is accepted.

Strategic Issues & Analysis

Reasons for Differences in ARL Land, Currently Farmed Lands, and Land Receiving the Current Use Tax Exemption

This technical memorandum reviews the list of Pierce County's current criteria which together identify land for ARL zoning and GMA compliance. These criteria identify parcels with a unique combination of location, soil and crop productivity characteristics, minimum parcel size, and size of abutting properties. The measurement of these factors can be subject to errors. As has been recognized by Pierce County, the current ARL classification is incorrectly estimated at 22,951 total acres (Figure 1). However, due to previous mapping errors, the total actual acreage that meets the required criteria has been calculated by the County to be 12,063 (based on 2013 data; see Figure 2).

Figure 2 – Pierce County Agricultural Resource Lands (ARL) – 2013 Corrected



The American Farmland Trust (AFT) estimated that there were 51,009 acres farmed land in the county in 2014. To create this estimate, AFT reviewed other datasets estimating farmland area and aerial photography, then performed ground-truthing and an expert review. As with any evaluation of land use on large scales, certain assumptions are made and there is always a margin of error in the process. However, this data indicates at a minimum that not all farmed areas in the County are designated as ARL.

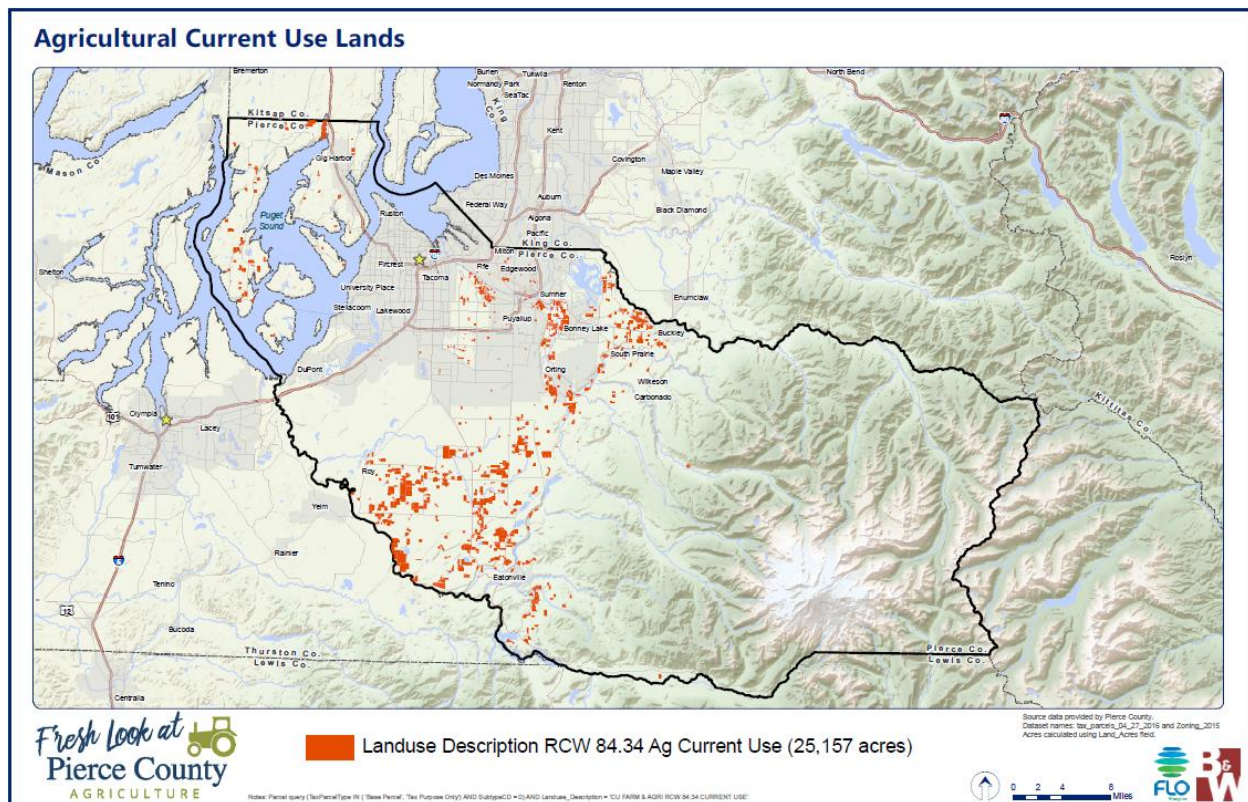
Another way to define and locate acreage of farmed land is to look at parcels currently enrolled in agricultural current use taxation. Agricultural landowners are able to voluntarily enroll in this tax program to receive a reduction in the assessed valuation of their property, if they continuously meet specific eligibility criteria. Application for and notice of continuance of this tax classification requires the submission of supporting documentation such as tax reports and income records to the Assessor-Treasurer's Office. The present enrollment estimate in Pierce County is 25,157 acres. (Table 2 and Figure 3).

Table 2: Land in Agricultural Current Use Tax Exemption Program

Parcel Size	Total Acres	% of Acres	Total Parcels	% of Parcels
< 5.0 acres	669	2.7%	244	18.5%
5.0 - 9.9 acres	2,307	9.2%	324	24.6%
10.0 - 19.9 acres	3,485	13.9%	253	19.2%
20.0 - 39.9 acres	9,690	38.5%	366	27.8%
40.0 - 99.9 acres	7,059	28.1%	119	9.0%
100.0+ acres	1,947	7.7%	11	0.8%
Totals	25,157	100.0%	1,317	100.0%

Source data provided by Pierce County; GIS analysis by FLO Analytics.

Figure 3 – Pierce County Agricultural Current Use Tax Exempt Parcels – 2015



Many – but not all – farmers enroll in the agricultural current use (ACU) tax program. The ACU program is briefly explained below to indicate why not all farmers who qualify apply for the program will enroll. The Current Use Open Space Taxation Act is intended to support landowners in voluntarily preserving farmland or open space on their property in exchange for a reduction in their property taxes. Some farmers and ranchers in Pierce County take advantage of this resource protection program. Others prefer to maintain their flexibility to transition their properties to different future uses, including development, without having to owe back taxes. Seven years of deferred taxes, plus interest is assessed for withdrawing the property from the ACU classification. There is also a two-year notification period before the withdrawal is allowed; otherwise an additional 20 percent penalty is assessed. This makes fast conversion of ACU land difficult and costly.

Larger, multi-generation farms and ranches as well as smaller farms and ranches in Pierce County wish to retain maximum flexibility with their land. Over the decades they have observed some of their neighbors selling some or all of their land for residential or commercial development and being able to retire or move with the profits. But not all farmers and ranchers can realize a net profit on a sale of ACU enrolled land for development after incurring the back taxes, interest and penalty charge.

Others may not enroll in the ACU tax program because they do not want to deal with the paperwork, submitting financial records to prove income qualifications, or the risks of potential audits. Others might consider this program to be an unwelcomed government intrusion on their privacy.

For all these reasons, lands enrolled in the ACU taxation program do not fully overlap with those lands in current agricultural production.

In contrast, the ARL designation is a zoning procedure which applies specific criteria suggested by the state's GMA across an entire county, or to specific districts within a county which have unique characteristics. The standard ARL designation criteria do not assess if a particular parcel is currently used for agriculture. The foundation ARL criteria of GMA only require that the land be **capable of** sustaining agriculture, and that it have potential for long-term commercial significance for agriculture. There are lands in the County currently used for valuable commercial agriculture that do not meet Pierce County's ARL designation criteria, and there are ARL designated lands that are not currently used for agriculture. While the intention of ARL is for counties to identify and protect their best agricultural resource lands, it is not perfect and it shouldn't be the only tool for protecting farmland and supporting the agricultural sector.

Parcel Sizes in ARL Designation

Table 3 shows the range of parcel sizes in the current ARL zones. While the minimum size parcel allowed in ARL is five acres, 369 acres are included in parcels smaller than this minimum. This is probably explained by subtractions due to the presence of small lots for existing home sites that are incidental to the agricultural use of properties. The significance of small farms is seen when viewing this data on parcel sizes in the ARL zone. The predominance of parcels smaller than ten acres is apparent – more than 22 percent of the total ARL acreage is in this parcel size category, which accounts from almost 46 percent of all parcels. Parcels in the 5.0 acres to 19.9 acres size ranges account for about 42 percent of the total ARL acreage (22,951).

Table 3: Pierce County Parcels in ARL Zoning (2015)

Parcel Size	Total Acres	% of Acres	Total Parcels	% of Parcels
< 5.0 acres	369	1.6%	116	7.7%
5.0 - 9.9 acres	4,774	20.8%	686	45.7%
10.0 - 19.9 acres	4,846	21.1%	363	24.2%
20.0 - 39.9 acres	6,076	26.5%	236	15.7%
40.0 - 99.9 acres	5,050	22.0%	89	5.9%
100.0+ acres	1,835	8.0%	12	0.8%
Totals	22,951	100.0%	1,502	100.0%

Source data provided by Pierce County; GIS analysis by FLO Analytics.

Divergence of ARL Designation Criteria with Agricultural Activity

It is useful to see how different types of data define which land is used for agriculture. We will consider the following three unique datasets: 1) the currently mapped land in ARL designation (totaling 22,951 acres); 2) the AFT inventory of currently farmed land (51,009 acres); and 3) the agricultural current use (ACU) tax properties (25,157 acres). The mapped overlap of these three datasets results in a total of only 7,970 acres (Figure 4 and Table 4).

Figure 4 – Overlap Areas: ARL, Currently Farmed, Current Use Tax Exempt – 2015

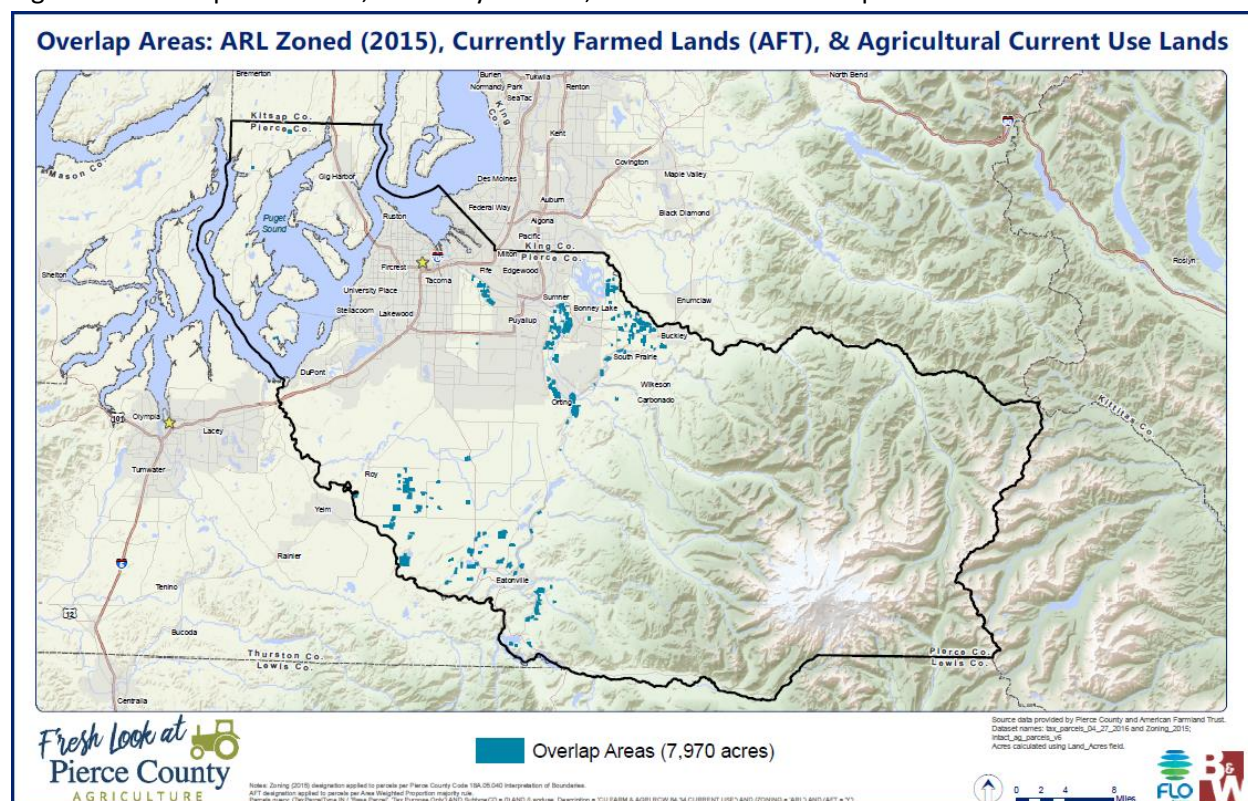


Figure 4 shows that these lands are more densely grouped in the Puyallup and Orting valleys, north of Bonney Lake, along the Buckley Plateau and more dispersed between Roy and Eatonville. When ARL zoning and ACU are combined, the overlapping acreage increases only modestly to 8,290 acres. When the datasets for AFT currently farmed land and ACU tax properties are combined, the total overlap increases to 16,815 acres. When the datasets for AFT currently farmed land and the ARL zoned properties are combined, the total overlap reaches 17,325 acres.

Table 4: Overlap Acreage ARL Zoned/Currently Farmed/Current Use Tax Exempt

	Total Currently Farmed (AFT), ARL Zone Designation and Ag Current Use Tax	ARL Zone Designation and Ag Current Use Tax	Total Currently Farmed (AFT) and Ag Current Use Tax	Total Currently Farmed (AFT) and ARL Zone Designation
Total Acres	7,970	8,290	16,815	17,325
Parcel Count	357	371	773	1,115

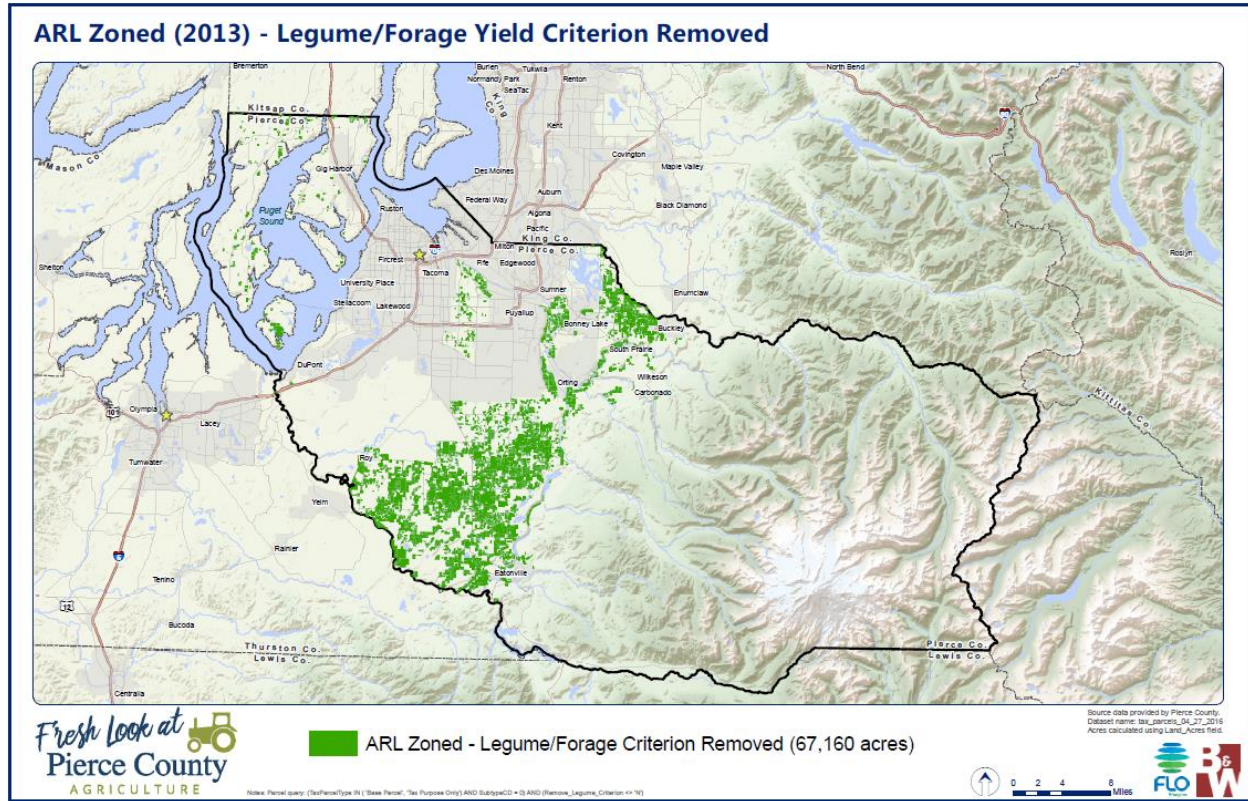
Source data provided by Pierce County and American Farmland Trust; GIS calculations by FLO Analytics.

Sensitivity of Total Acreage to the Grass-Legume Hay Yield Criterion

The sensitivity of total acreage in ARL zoning if the grass-legume hay yield criterion is removed was evaluated. If all other designation criteria remain unchanged and grass-legume hay yield is eliminated,

the resulting total acreage meeting the ARL criteria greatly increases to over 67,000 acres (Table 5 and Figure 5). This increase is close, but slightly higher than earlier Pierce County estimates of the impact of this single criterion. Most of the acreage increase from elimination of the grass-legume hay yield criterion comes from the central and south county areas. Much of the additional land is in smaller parcels and is predominantly grass/pasture land.

Figure 5 – Pierce County ARL Zoned Lands with Grass/Legume Yield Criterion Removed – 2013



**Table 5: ARL Zoned Acreage with
Grass/Legume Yield Criterion Removed**

Parcel Size	Total Acres	Total Parcels
< 5.0 acres	175	59
5.0 - 9.9 acres	21,536	3,489
10.0 - 19.9 acres	14,531	1,095
20.0 - 39.9 acres	16,443	660
40.0 - 99.9 acres	10,228	178
100.0+ acres	4,247	25
Totals	67,160	5,506

Source data provided by Pierce County and American Farmland Trust; GIS calculations by FLO Analytics.

Possible Replacements for the Legume-Forage Hay Yield Criterion

Other commonly used methods of assessing soil productivity are available as alternatives to the grass/legume yield criterion, but they are either not applicable to Pierce County, or are less useful than the legume/forage method described above. For instance, corn suitability ratings (CSR2) provide a relative ranking of all soils mapped in Iowa according to their potential for the intensive production of row crops, but are not applicable to Washington. The National Commodity Crop Productivity Index (NCCPI) uses natural relationships of soil, landscape, and climate factors to model the response of corn and soybeans, small grains, and cotton. With the exception of some small grain crops, these commodities generally don't perform well under western Washington conditions. The intent of adding the yield criterion is to ensure that the ARL parcels on average contain more productive soils. However, this analysis indicates expected outcome is not necessarily produced. For that reason, the yield criterion may not be useful for determining ARL suitability, but an equivalent alternative criterion is not readily available. Other jurisdictions do not typically use a yield criterion, but instead adjust details such as primary or adjacent parcel size to improve the analysis outcome.

Summary & Conclusions

Current Pierce County ARL designation criteria meet the requirements of GMA. However, there are issues of application that likely detract from the protection and enhancement of the agricultural resource lands in the long-term. The main elements to further evaluate are:

- Given the major differences in the types of agricultural crops and livestock production activities in the county, it may be advisable to consider specific designation criteria for each agricultural production district or sub-area.
- Data limitations and the need to objectively measure and map the criteria must be recognized and carefully considered.
- The combination of small minimum parcel sizes (5+ acres) together with allowance for small-sized abutting parcels (1+ acres for 50 percent of ARL parcel perimeter) leads to many "islands" and "peninsulas" of ARL designated land surrounded by conflicted non-resource land uses. The lack of logical boundaries to the ARL designation and the high potential for conflict with other land uses likely detracts from the economic viability of the agricultural sector in the county over the long-term.
- Any single crop yield or productivity measure is not very useful in determining absolute potential agricultural productivity for a given soil, or even for comparing relative agricultural productivity between soils because of different production requirements for different crops.
- The soil survey map used for the June 1981 publication, ***Important Farmlands of Pierce County***, identified in the Pierce County Code is out of date and should be removed from the County Code.

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