

CHAPTER 5

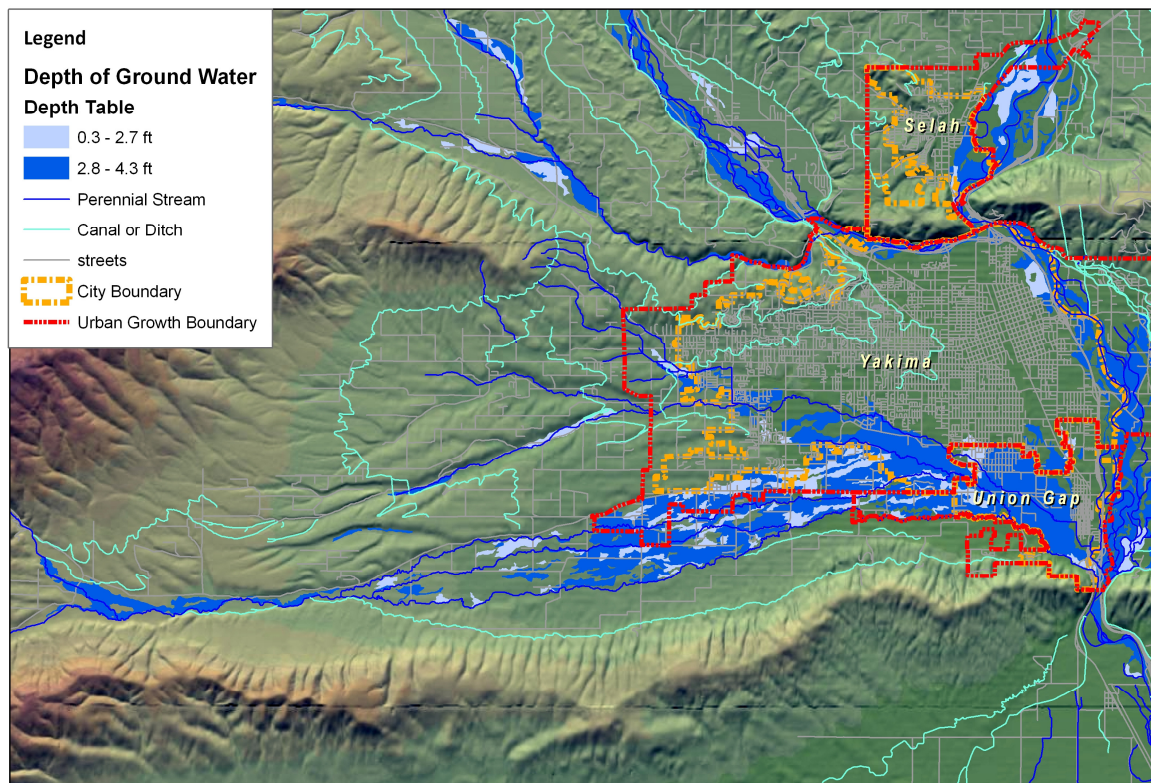
DEVELOPMENT IN BASIN FLOODPLAINS

CURRENT DEVELOPMENT

Much of the Ahtanum and Wide Hollow watersheds are rural in character and devoted to agricultural uses. Currently, the land use and economic activity within the area is rapidly changing through conversion from agriculture to urban use as the cities of Yakima and Union Gap expand west into these watersheds. Industrial development is also occurring in the floodplain west of Union Gap and near the airport. Flooding concerns about loss of use of agricultural land and crop damage are being replaced by concerns of damage to homes and businesses, plus loss of access during floods. In addition, agricultural diversions still in place create entry paths for flood waters to unexpected areas.

Figure 5-1 shows lands that have shallow groundwater within three feet of the surface. This is another physical feature that limits or adds to the expense of development in the valley west of Union Gap and Yakima. Shallow ground water increases the probability of soil saturation during storm events, increases costs related to subsurface and infrastructure construction, and degrades sewer system performance.

Figure 5-1 Shallow Groundwater Areas

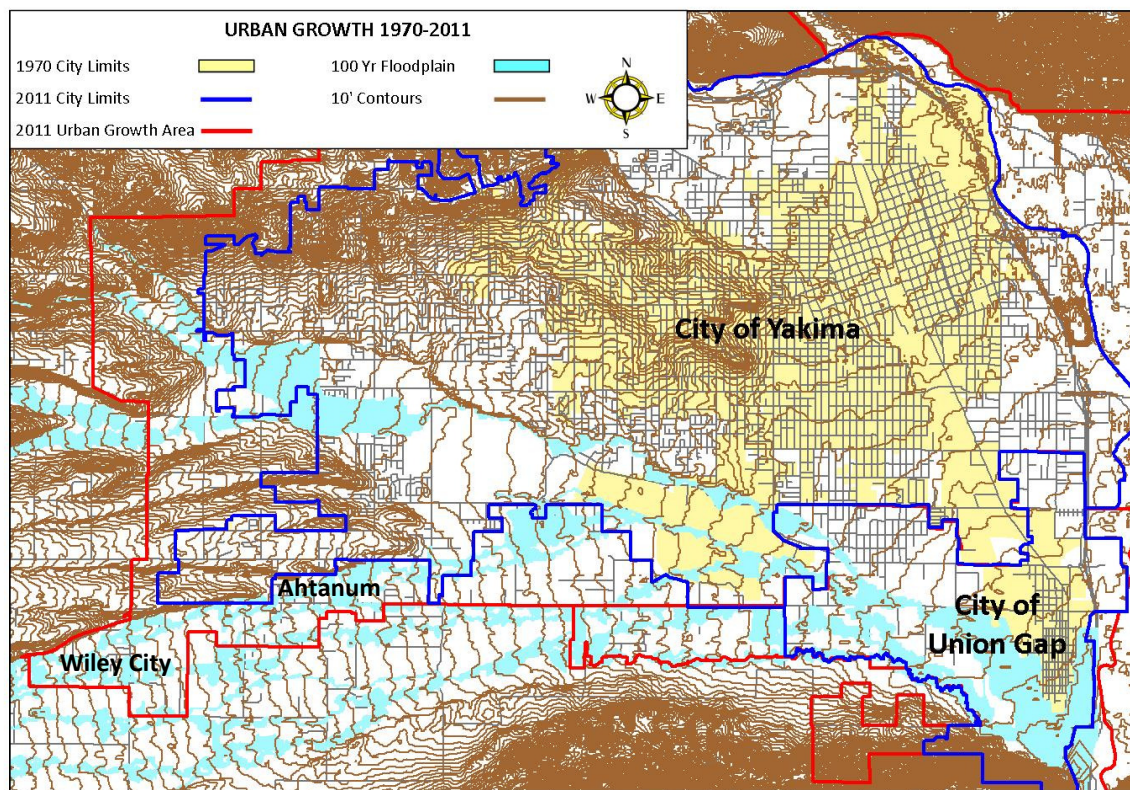


Urbanization of CFHMP Area

Urbanization in the basin has occurred through subdivision of lands in the unincorporated county and by annexation. Current urban zoning regulations add pressure to increase development density and infrastructure in floodplains. The towns of Ahtanum and Wiley City have existed since the 1880s, and currently exhibit many urban characteristics such as businesses and business zoning, high residential density and small lot size. Both these communities lack other urban services such as water and sewer utilities, which have in the past created public health concerns and efforts to provide these services to those communities.

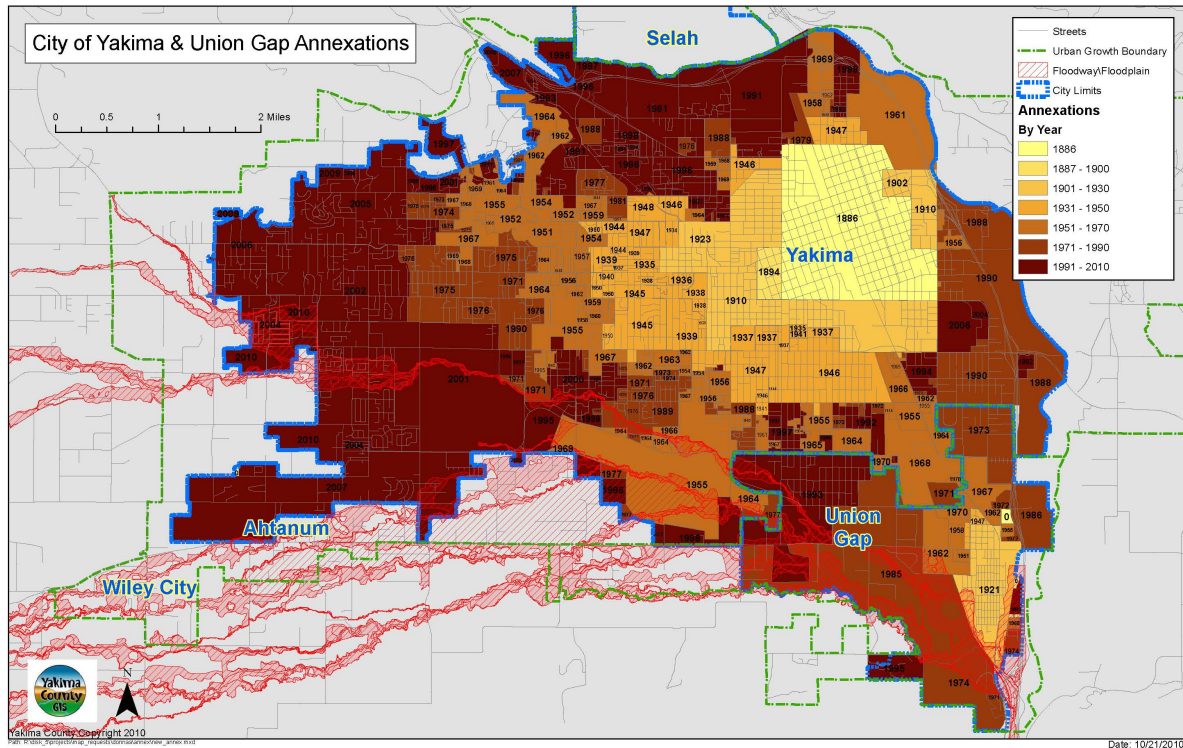
Union Gap is located in lower flatter land at the confluence of these two creeks with the Yakima River and has always dealt with constraints from flooding and a water table near the surface. The City of Yakima, which is protected by levees from the Yakima River built after World War II, and contains a large area west of 16th Avenue located on high ground and has only more recently expanded into flood prone areas due to annexations westward. A high proportion of the remaining developable land is located in or near floodplains. Figure 5-2 shows the elevation contours and floodplains versus the recent and expected future city expansions.

Figure 5-2 Urban Growth 1970-2011



Lands west of urban Yakima and Union Gap have undergone annexations in response to urban growth demand, removing lands previously devoted to agriculture or its supporting activities. The majority of the annexations have been to the City of Yakima. Figure 5-3 shows the annexation history of the two areas from 1940 to 2010.

Figure 5-3 City of Yakima & City of Union Gap Annexation History



The largest annexations of floodplains in the CFHMP area occurred when the airport and the surrounding area was annexed in the 1950's, and since 2000. These annexations substantially increased the urban land proportion into flood prone areas, as shown by the red hatched areas in Figure 5-3. The accelerated trend of expansions has been accompanied by increased road, sewer and infrastructure construction in the floodplain.

The potential dangers from overdevelopment in flood prone locations is currently being experienced in Kent, Auburn and Renton on the Green River, as they face huge economic costs and development restraints from aging flood protection measures that could not be sustained over the long term.

Addressing land use through zoning is an important aspect of minimizing future flood damage in both rural and urbanizing areas. A means of preventing or reducing intense development in high-risk flooding areas, or committing to mitigating measures is desirable. Prevention of intense development in high-risk areas is one of the most effective methods to minimize flood risks and is further discussed in the Alternatives and Recommendations Chapters.

SOCIOECONOMIC CHARACTERISTICS

The Ahtanum-Wide Hollow area includes portions of the cities of Yakima and Union Gap, as well as suburban and rural areas west of the cities. The top three employment sectors in

Yakima County are “Educational, health and social services,” “Manufacturing,” and “Agriculture, forestry, fishing and hunting, and mining” (U.S. Census 2000). In the rural portions of the Ahtanum Creek cattle ranching is common, as well as various types of agriculture.

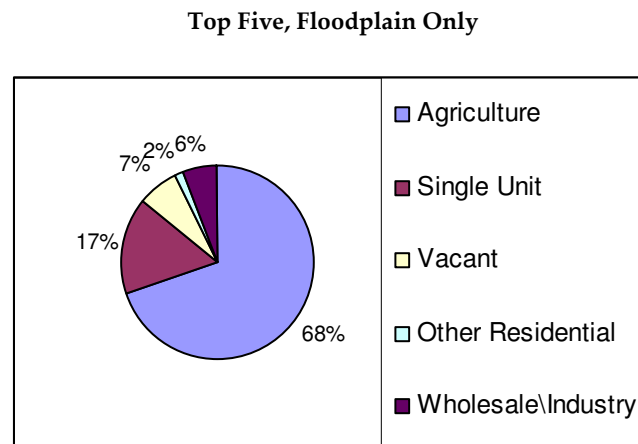
LAND USE

For the purposes of this CFHMP, Yakima County GIS combined the City of Yakima’s 2004 land use survey with Yakima County’s 1996 land use information, creating a combined map and spreadsheet (current land use for Union Gap was not available).

Land use patterns show that most of the floodplains in the Ahtanum-Wide Hollow CFHMP area (67.2%) were in agricultural use at the time of the surveys. Forage crops, such as hay, are most common, but fruit production is increasing (Ahtanum Assessment Executive Summary, 2004). The Pope Decree (Ch. X, page y) limits the types of agriculture that can occur within the Ahtanum Irrigation District to hay and forage crops unless supplemental irrigation (from groundwater) is available.

Single Unit housing is the second most common land use type in the floodplain (16.1%). Vacant land makes up 6.5% of the floodplain, followed by land used for Wholesale/Industry (5.5%). See Figure 5-4 below.

Figure 5-4 Land Use, Yakima County and Yakima Combined

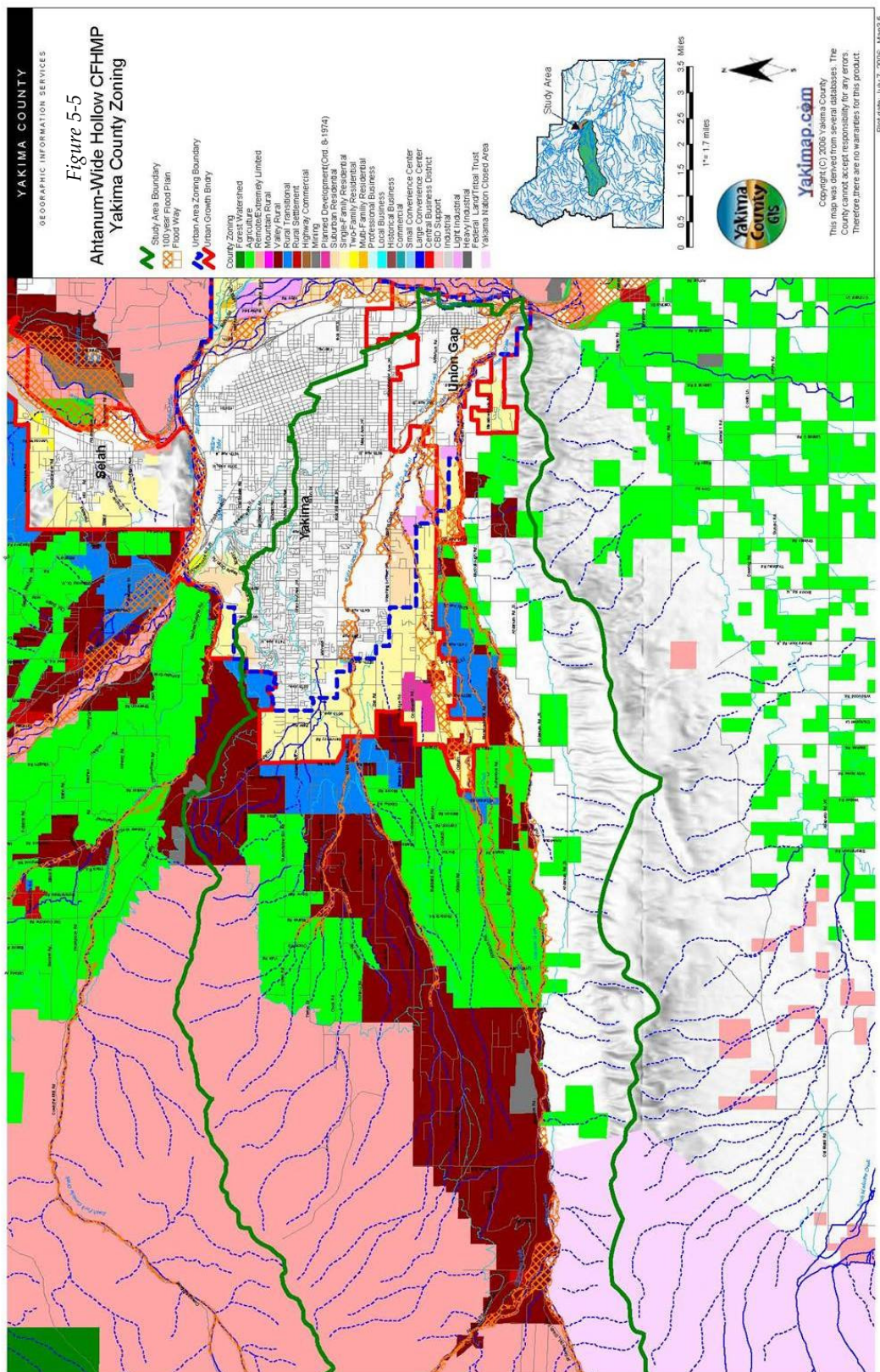


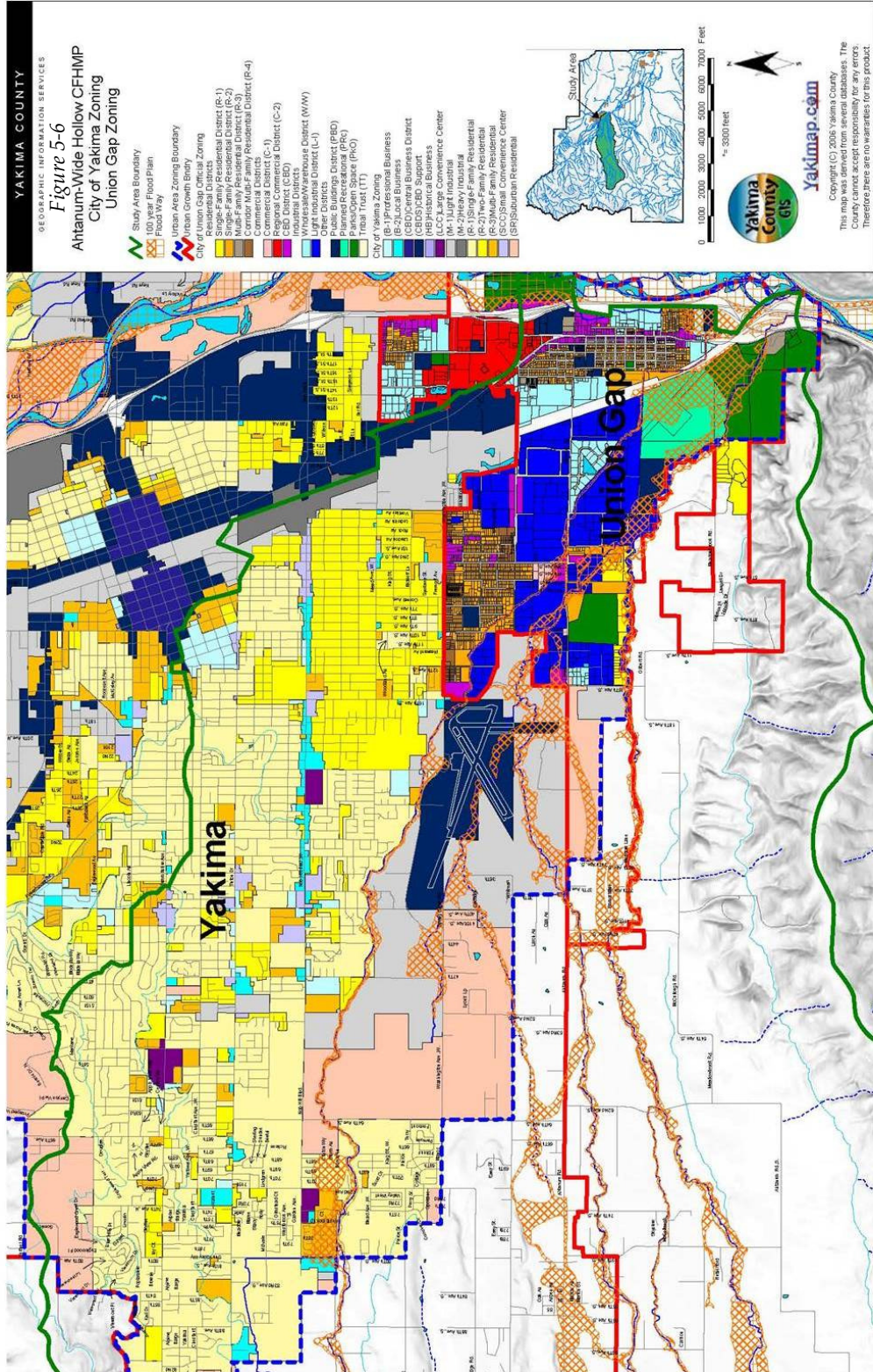
ZONING

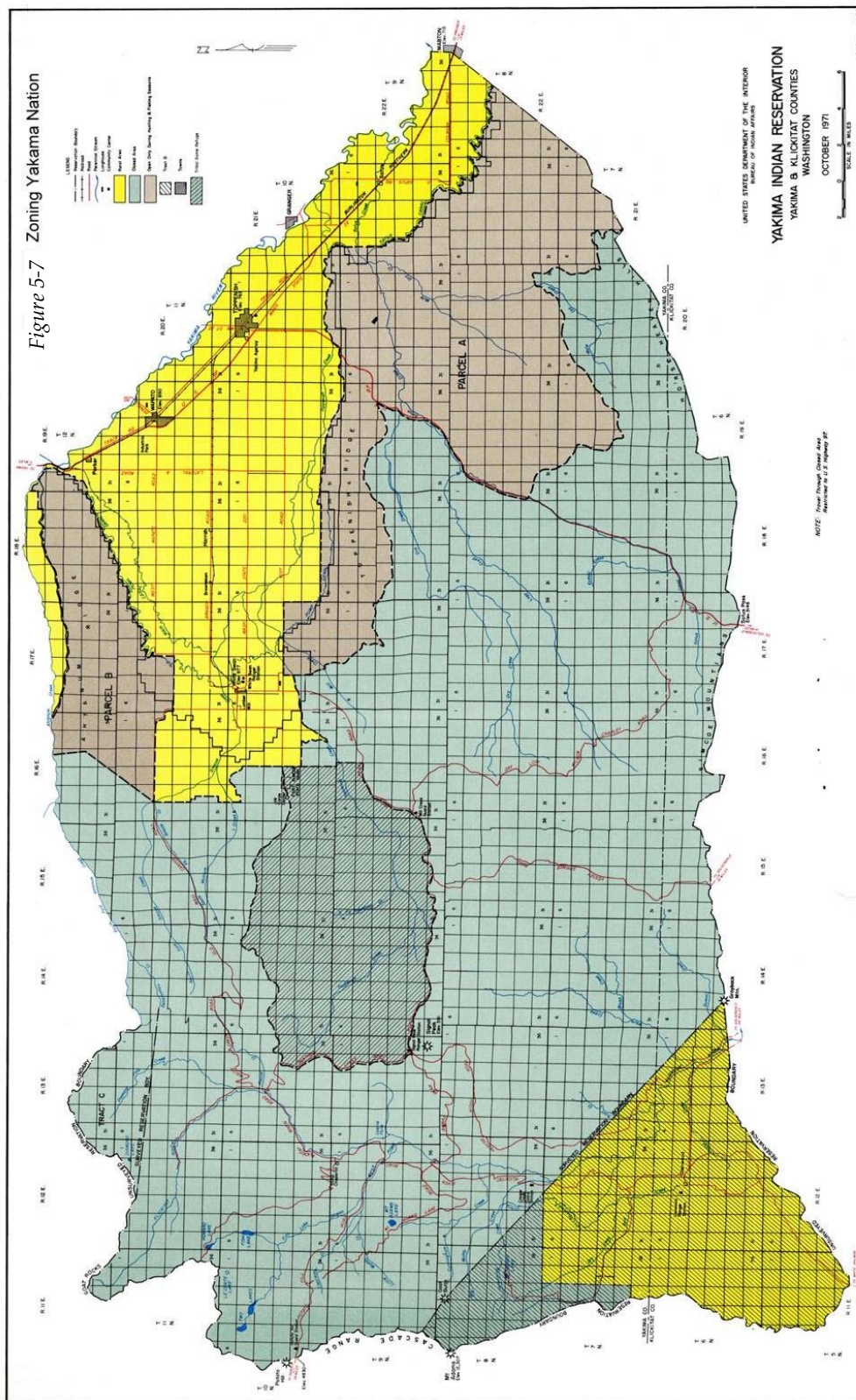
Since Ahtanum and Wide Hollow Creeks flow through three local jurisdictions, it is necessary to analyze zoning patterns in each jurisdiction (Yakima County, the City of Yakima, and the City of Union Gap) separately. Zoning data from 2005 was used for the analysis of the cities and county. The unincorporated section of the CFHMP area in Yakima County is predominantly zoned for rural and limited use. The largest percentage of land in the floodplain is zoned as Valley Rural. This zoning designation “is intended to protect and maintain the openness and rural character of outlying areas of the county in the lower Wenas, and the valley floors of the lower Ahtanum, Naches and Yakima Valleys” (Yakima County Code, 2005). While this zoning designation will greatly reduce the potential for creation of new lots in the floodplain, along the North Fork Ahtanum, there are a significant

number of small lots that were created prior to zoning, and which would result in high development density and flood hazard if they are developed to their full potential. Agriculture is the second most common zoning designation in the floodplain (24%), followed by Single Family Residence (18%). Other zoning designations that are represented in the floodplain include Federal/Tribal Trust, Forest Management, and Rural Transitional, which are not shown on the County Zoning map west of the Valley Rural zoning on N. F. Ahtanum Creek. See Figure 5-5 for County zoning, Figure 5-6 for City of Yakima and Union Gap and Figure 5-7 for Yakama Nation zoning maps.

The zoning map for the Yakama Nation is broken into large categories that aren't applicable to the type of floodplain zoning review analyzed for the cities and county. For the Yakama Nation, most of the lower Ahtanum is zoned Rural Area; the next area upstream is zoned Open Only During Hunting and Fishing Seasons; with the remainder of the Ahtanum and South Fork Ahtanum zoned Closed Area.



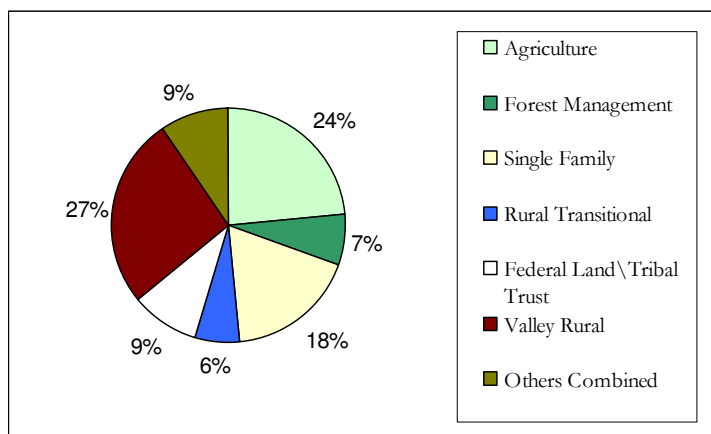
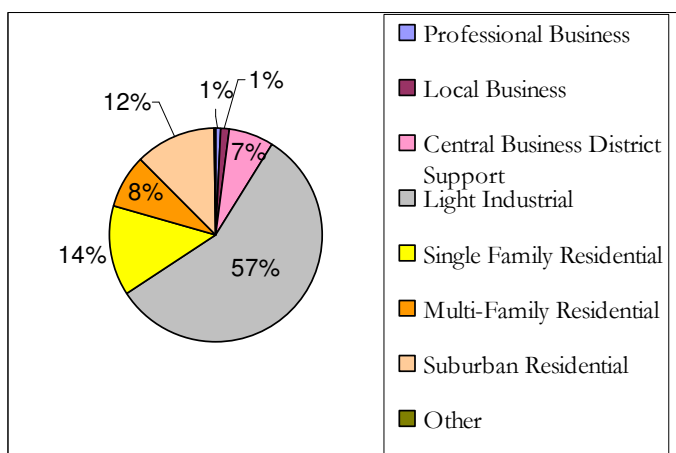
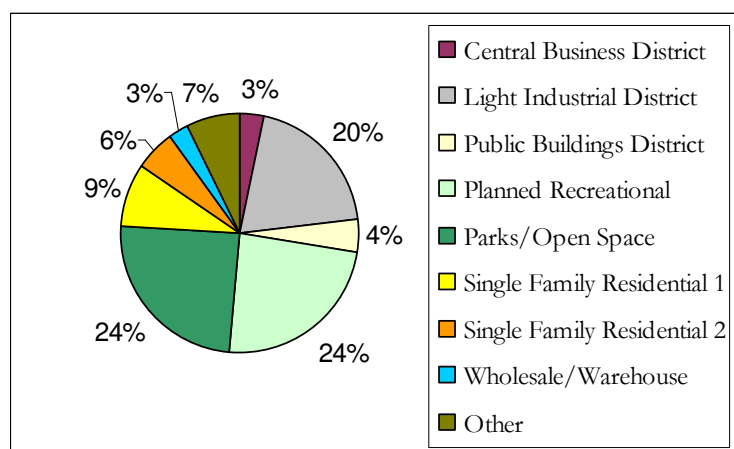




Pie charts for percent of specific zoning in the floodplain are in Figure 5-8 through 5-10 below. The analysis was based on 2005 zoning data for all jurisdictions. See Appendix A for more detailed land use and zoning tables.

Land within the floodplain of Ahtanum and Wide Hollow creeks in the City of Yakima reflect the urban character of the city, and show that for many years the floodplains now in the city were not developed for residential uses. Light industrial zones, primarily associated with the Yakima Regional Airport, dominate the floodplain zoning districts within the City of Yakima, and much of this land has recently been developed for this purpose. A smaller area of residential zones is located on Wide Hollow creek, upstream of 40th avenue. Much of this land is still in agricultural use on the former Condon Orchard property, but will see conversion to actual residential use in the future. The City of Yakima does not have actual open space or agricultural zoning designations which would provide greater protection of floodplains from development than their lowest density zone, which is currently R1, which when it's used in the flood overlay zone, would allow development on one acre or larger lots.

Significant areas of floodplain in Union Gap are zoned as Parks/Open Space or Planned Recreational. These zoning districts occur in the combined floodplains of lower Ahtanum and Wide Hollow Creeks, near their confluence with the Yakima River, an area of relatively high flood frequency. Upstream, land within the floodplain is zoned as Light Industrial which allows for some commercial development, such as Costco, as well. These areas do not see as frequent flood events, but careful site planning is still necessary due to areas of high groundwater during most of the year. Single Family Residential 1 and Single Family Residential 2 make up most of the remainder of Union Gap's land in the floodplain. Most of this land is fully developed, and Wide Hollow creek has been severely confined (along Pioneer Ave) or wholly modified (lower Wide Hollow). Both areas have seen significant flood damage during major flood events. Other classifications represented include the Public Buildings District along Ahtanum Road adjacent to Wide Hollow which is the proposed new location for Union Gap's City Hall and currently undeveloped. A small area is zoned Central Business District in the area where Wide Hollow crosses under Main Street. Due to the confined nature of the creek and low gradient, businesses in this area have seen repeated flood damage.

Figure 5-8 Yakima County Zoning in the Floodplain*Figure 5-9***City of Yakima Zoning in the Floodplain***Figure 5-10***City of Union Gap Zoning in the Floodplain**

The pie charts above, for the 3 non-tribal jurisdictions in the CFHMP area illustrate that there are not common zoning districts. As urban growth areas expand, land is transferred from County jurisdiction, to joint jurisdiction (urban growth area expansion) and eventually into city jurisdiction. Zoning designations will accompany each of these moves, or can occur every other year during Comprehensive Plan updates. For the most part in the Ahtanum and Wide Hollow watersheds this transition should occur with minimal or no increase in flood hazard.

There are locations adjacent to the Urban Growth Areas (UGA's) that could, if incorporated into the UGA and eventually one of the cities, present a significant increase in flood hazard. As shown in the pie chart above, there are areas of floodplain in the County jurisdiction that are zoned either Valley Rural or Agriculture, which require the retention of relatively large parcels, and the zoning was intended to protect floodplains as well when allowed land

divisions occur. Several floodplain areas with these zoning designations about the City of Yakima or Union Gap UGAs, mainly along Ahtanum Creek.

Without an open space designation expansion of the UGA into these floodplains will increase residential or other lot density from 5 acre (Valley Rural) or 20 (Ag) acre to an average of an acre or less depending on the new urban zoning designations and associated subdivision regulations in floodplains. Increases in flood hazards can be avoided by the cities through either Ag, Open space, or other zoning designations that maintain large lots and floodplain function in the floodplain and adjacent areas. Where no such low density zoning designations exist in a city's zoning code, development density and flood hazard will increase unless other tools, such as flood or habitat preservation easements are employed. Additional specifics about the Urban Area Zoning Ordinance are located in Chapter 6.

ECONOMICS OF FLOODPLAIN DEVELOPMENT

The Ahtanum and Wide Hollow basins are flood-prone and are being converted from agricultural to urban usage, as indicated by the zoning and annexations, described above. Development in these floodplains has been subject to relatively frequent flood damage and access issues for floods more frequent than the FEMA 100-year flood threshold.

Economic loss due to loss of access, loss of function and emergency response impacts businesses, homeowners and the community at large. Losses in Yakima County from the 1996 flood alone were estimated at \$18 million. Yakima County carried \$5 million in claims that required federal reimbursement and resulted in County cash flow issues for several years. Insurance policies, limit damages to homeowners and businesses to the amounts insured, which have upper limits (i.e. \$250,000 for a residence through NFIP). The average NFIP claim is \$25,000. Disaster relief funds are only available for federally declared disasters, which has threshold criteria not easily attained, and are when obtained are usually on a loan basis. Disaster claims average \$2,500.

Currently, thirty percent of FEMA nationwide flood insurance claims are from outside the FEMA 100-year floodplains indicating that floods can exceed the mapped 100 year flood level areas and inundate unexpected locations.

Due to the exorbitant costs of disaster relief in the past, FEMA regulations restrict development in the floodplains. To reduce disaster and flood insurance claims, FEMA provides minimum regulations for development in floodplains that are coupled with the National Flood Insurance Rate Maps adopted by the community. New residences and businesses are allowed in the flood fringe with attendant restrictions, but are not allowed in the floodway. To reduce the public burden of disaster relief funding, flood insurance is required for these structures, should any part of the mortgaging be supported by federal funds. Flood insurance rates are high since the odds of flooding are high. There is a 26% chance of flooding during a 30-year mortgage for properties in the 100-year floodplain. Due to the high risk associated with floods, private underwriters are reluctant to offer flood

insurance and most flood insurance is underwritten by the National Flood Insurance Program (NFIP). Due to the National Flood Insurance cap for businesses of \$500,000 for the building and another \$500,000 cap for contents, larger businesses must purchase insurance through private underwriters. Flood insurance at significantly higher rates than from NFIP can be attained through underwriters like Lloyds of London.

Many homes in most communities, particularly those without mortgages, do not have flood insurance, or do not have insurance that covers their current value.

The impact of new development cannot raise the flood elevation, also known as the Base Flood Elevation (BFE), by more than one foot and buildings must be built at or above the BFE. This rule allows new development to raise flood levels to inundate older developments built at BFE by up to one foot. Consequently, FEMA has provided a model ordinance more stringent than their regulations which recommends a number of items, including raising residential structures requirement one foot or more above the BFE. The Yakima communities are still using the BFE level requirement.

Although federal insurance costs are representative of community damages within flood plains, they currently subsidize existing development in floodplains prior to current insurance standards. Flood hazard planning through building elevation and building siting above minimum standards will reduce insurance costs that are subsidies and will keep insurance subsidizing dollars within the community.

Communities benefit financially from slightly higher standards for flood insurance premiums, even without considering the reduced impacts and loss from floods. The chances of inundation and loss are substantially reduced by providing more accurate flood mapping and raising the minimum floor elevation above the BFE. Not only is the chance of damages, flooding and hardships reduced, so are the insurance premiums paid by the owner, which are largely lost to the community. Raising the minimum floor elevation one foot would reduce the chance of inundation during a 30 year mortgage from 26 percent to around 5 percent and reduce the annual insurance premium per hundred thousand dollars of insurance from \$816 to \$451, a 45% savings.

The cost of raising a home one foot at the time of construction is well under five thousand dollars if a wall is used, and less if reguarding or fill is used, and would pay for itself during the first six years or less of the mortgage. At this time the International Residential Code used by Yakima jurisdictions, requires elevation of the structural members and insulation to approximately one foot, so that the base floor sits at one foot above BFE. The jurisdictions would realize the insurance fee savings by formally adopting the current practice, which is effectively one foot above BFE. Raising the minimum floor elevation another foot to two feet would reduce the insurance to \$276 for a total of 66% savings.

Local communities and the state can adopt higher standards than the FEMA minimum in order to minimize community losses and exposure. For example, in response to frequent damage and loss in floodplains, neighboring Pierce County has chosen to expand their definition of the floodway, where new development is highly restricted, to include the channel migration zone and areas of deep and fast flows. This has almost doubled the area

of their floodways within their floodplains, moved more people out of harm's way, and reduced hazard and economic exposure.

With the conversion in Ahtanum and Wide Hollow basins from extremely low density farmland, where flooding was permissible, and in some cases desirable, to high density development of homes and businesses, the level of suffering and the cost of future damages in new development will be undertaken by the new owners and the community through damages and insurance fees.

Protection of these lands by levees is not practical in this watershed for reasons noted earlier, and even if so, would require further public expenditure. Experience elsewhere in the County indicates that levees also increase flood exposure through encouraging further development in a vulnerable location. This is a major concern in King and Pierce Counties.

ECONOMICS OF FLOOD PLAIN ZONING AND FLOODPROOFING

Land use zoning and infrastructure protection should recognize the economic impact of flood plain development. Two methods to reduce damages and insurance premiums for development in floodplains are raising structures and flood proofing. As the costs differ by land use, land use zoning is an important tool to reduce flood damage costs.

The following extract from the 1991 Department of Ecology, "Comprehensive Planning for Flood Hazard Management Guidebook", indicates the practicality and relative costs by land use.

"Flood proofing might be defined, generally, as the construction or remodeling of physical structures such that during floods they can either be closed or their occupancy can be modified so that inundation, siltation, or velocity damage can be minimized. While it may be rather expensive and impractical to completely flood proof all developments, *this method together with land use regulation (italics added)*, is useful in reducing flood damages."

The feasibility of such activity depends considerably on the use of flood plains. Existing activity may be flood proofed but, in general, this would probably be more difficult and costly than designing flood proofing into new developments. In urban areas where development proceeds at a rather rapid pace, flood proofing techniques for different types of development are briefly outlined as follows.

Light Industry

Typical flood proofing measures might include elevating all processing operations and storage facilities of materials, especially hazardous materials, subject to damage above the flood plain elevation.

Commercial Enterprise

Firms selling products and/or services for human consumption may find flood proofing relatively more difficult and costly than in the case of industry. Nevertheless, it may be entirely feasible in this instance, to develop customer parking and receiving and delivery areas directly on the flood plain. Suitable access could then be provided to upper level trade areas (perhaps only one-half of the normal flood height above existing grade). Inundation would thus occur only to areas which could be evacuated. As an alternative, flood doors and other partitions with sealing mechanisms could be provided so that areas could be closed with advancing flood threat.

Residential Occupation

Flood proofing here would appear to be the least practical of the three examples cited. Physically, the difficulty would not be insurmountable, but in terms of relative cost requirements, the benefit-cost ratio may be very low for existing structures. However, it may be entirely feasible and possible (if the terrain of the flood plain so allows) to construct new residences on existing “backgrounds” or on built-up areas. Yards, parks, school playfields, and public recreation could then be placed on lower levels of the flood plain. The NFIP standards (see below) require that the first floor of all new residential buildings be at or above the 100-year flood level.

Utilities

Any development on the flood plain will require that certain utilities (e.g., lights, heat, and water) be available to them. Placement of utilities on the flood plain should be designed to withstand sedimentation, erosion and other forms of damage. This is particularly important if activity is to continue on the flood plain under flood conditions.

The real key to a successful flood proofing program is to coordinate activity with land use controls and structural flood hazard management measures so that the most cost effective approach is taken for a given situation (italics added). For example, in some undeveloped sections of a watershed, flood proofing may be much more cost effective than dikes or levees. To achieve this coordination, the flood hazard management planning process *must bring together those in charge of building permit review, land use regulations and public construction (italics added).* Usually, this requires the often difficult task of framing a common strategy among the local departments of planning, building and public works.

Ecology does not require that local flood plain management ordinances exceed the NFIP standards. However, in many cases it may be advisable for local governments to set higher standards than those imposed by the NFIP. For example, the NFIP requires that the first floor of new residential construction be at or above the 100-year flood level. *A local*

community may wisely elect to set the minimum elevation at 2 feet above the 100-year flood elevation to allow a greater margin of safety for several reasons (italics added), including:

- Projection of higher flooding levels due to changing conditions in the watershed.
- Lack of data in hydrological modeling.
- Special conditions that could exacerbate flood conditions.

The preferred land use in floodplains to minimize community costs would be, in order, open space, parks, golf courses, agriculture, light industry, commercial and low density residential. In order to reduce costs these land use preferences should be fully considered in future floodplain planning and zoning decisions

PLANNING FOR FUTURE FLOODPLAIN DEVELOPMENT

Table 1-1 identifies hazard reduction goals for land use, which include:

- mitigate increased hazard risk created by development,
- minimize residential structures in “harm’s way”,
- evaluate lands prone to repetitive flooding in relation to open space uses,
- minimize residences located in designated areas and
- ensure that all development can be adequately provided with life safety services.

The City of Yakima, Yakima County, and FCZD staffs have reviewed proposed changes to the Yakima Urban Area Zoning Ordinance, which was prompted by adoption of the updated *Yakima Urban Area Comprehensive Plan 2025* in December 2006. Bringing this ordinance in line with the Plan 2025 policies will help recognize the land use and density limitations of lands in flood-prone areas. The *Yakima Urban Area Comprehensive Plan 2025* replaces the 1997 *Yakima Urban Area Comprehensive Plan*.

The goals and policies established in Yakima Urban Area Comprehensive Plan 2025 apply to the entire Yakima Urban Growth Area, including the West Valley Neighborhood Planning Area. In addition, *Plan 2015* (the Yakima County Comprehensive Plan) is a regional plan that establishes the County’s perspective on urban policy and the transitioning of land from rural and resource uses to urban uses.

The 1997 *Yakima Urban Area Comprehensive Plan* did not include detailed planning for the west and southwest portion of the Yakima UGA, an area now known as the West Valley Neighborhood Planning Area¹. The Planning Area consists of West Valley lands that were not included in the “Yakima Urban Area” designated in the mid-1970s in conjunction with the planning for the regional wastewater system. As such, the West Valley Planning Area

¹ The 1997 *Yakima Urban Area Comprehensive Plan* referred to the West Valley Neighborhood Planning Area as the “Urban Reserve.” However, in December 2006 the Board of Yakima County Commissioners and the Yakima City Council adopted an updated plan for the Yakima UGA entitled *Yakima Urban Area Comprehensive Plan 2025*. Because the update eliminated all references to the “Urban Reserve,” the West Valley Neighborhood Planning Area will refer to this area as the “West Valley Neighborhood Planning Area” or simply, the “Planning Area.”

represents additional West Valley lands designated after 1997 for future urban growth². The 1997 *Yakima Urban Area Comprehensive Plan* contemplated that a neighborhood plan would be developed for this Planning Area at a later date through a joint process involving Yakima County, the cities of Yakima and Union Gap, and West Valley residents.

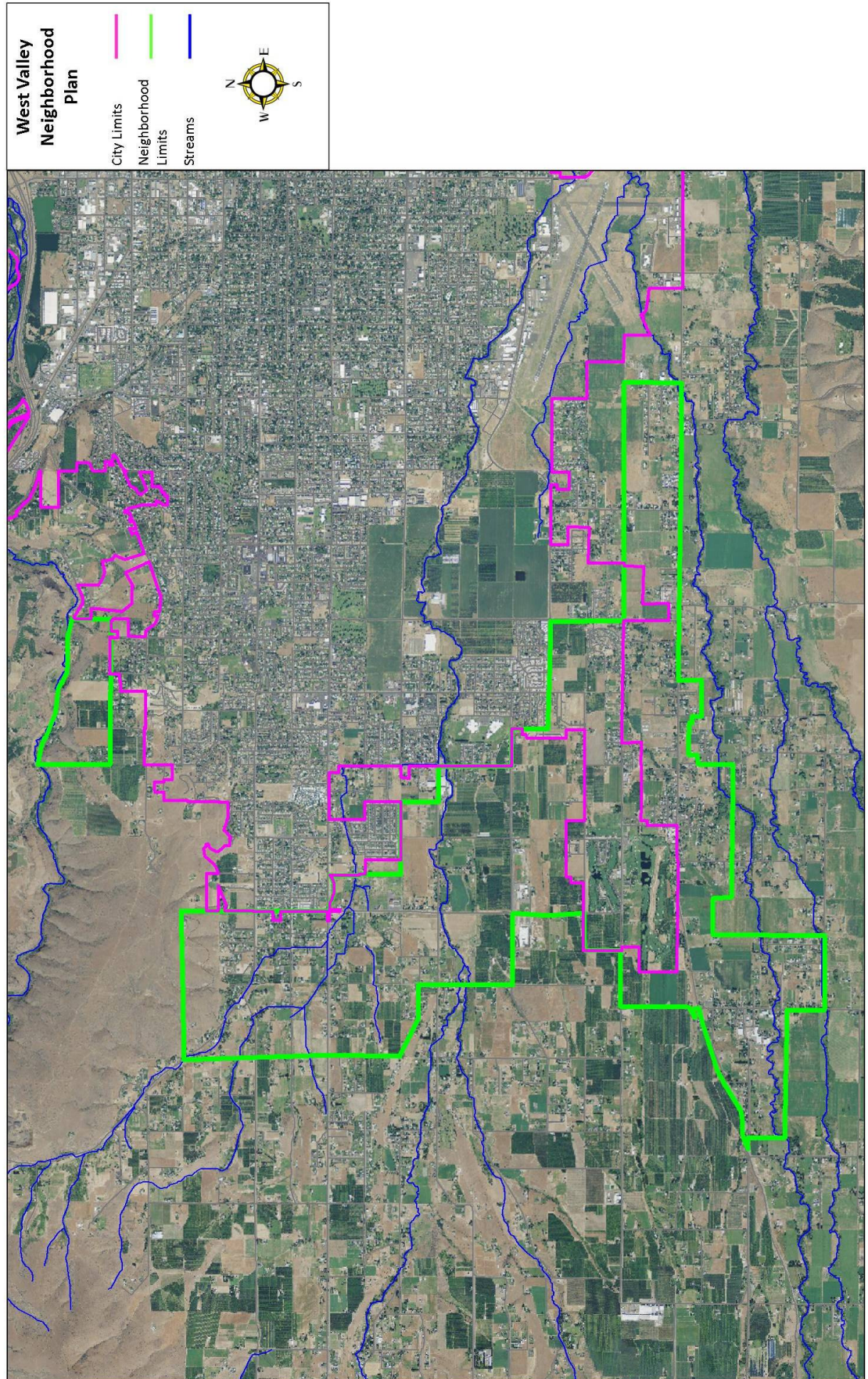
The *West Valley Neighborhood Plan* (WVNP) is the fulfillment of that intention. Figure 5-11 shows the initial West Valley Neighborhood Planning Area (for final the planning area boundary, refer to the WVNP). In 2006, approximately 74% of the Planning Area was vacant or undeveloped, but urban development is rapidly occurring.

In early 2005, the West Valley Neighborhood sub-area planning process was reactivated with a new emphasis on mobility, housing and parks & open space. With these three areas of emphasis in mind, work went forward to provide a framework that would guide a renewed effort with adoption of the Plan in 2010. The WVNP plan would provide guidance for locating housing of various densities, commercial uses, and industrial uses. The WVNP is to guide urban service planning in the West Valley Urban Area. Flood related topics were incorporated into the WVNP by the County planning department.

The WVNP, including the area-wide rezone, was adopted by both the City of Yakima and Yakima County to provide a common vision for the future physical development of this portion of the Yakima urban area. They became effective on February 28, 2010 in the unincorporated area, and on March 20, 2011 inside the Yakima City limits. The WVNP covers a narrow north-south strip of the CFHMP area immediately west of City of Yakima boundary. Additional information and zoning maps are available in the WVNP.

² The Board of County Commissioners expanded the Yakima UGA in 2003 by adding the “Apple Tree” area, and again in 2007 by adding the “Dazet” and “Scenic” areas, which are now included in the WVNP Planning Area.

Figure 5-11



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