

Klickitat County Shoreline Master Plan Analysis

Final Report for:
Confederated Tribes of the Yakama Nation

Prepared by:
Community Planning Workshop

Community Service Center
1209 University of Oregon
Eugene, OR 97403-1209
Email: cpw@uoregon.edu
<http://darkwing.uoregon.edu/~cpw>

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Jeff Spencer, Confederated Tribes of the Yakama Nation
Klickitat County Planning Department
Washington State Department of Ecology

Research Team:

Adam Lake
Jessica Neff
Kitty Rasmussen
Swati Sanghavi

Project Manager:

Kristopher Ackerson

CPW Staff:

Robert Parker

About Community Planning Workshop

Community Planning Workshop (CPW) is an experiential program within the Department of Planning, Public Policy and Management at the University of Oregon. Established in 1977, CPW provides students the opportunity to address planning and public policy problems for clients throughout Oregon. Students in the Master of Community and Regional Planning Program work in teams under the direction of faculty and Graduate Teaching Fellows to develop proposals, conduct research, analyze and evaluate alternatives, and make recommendations for possible solutions to planning problems in rural Pacific Northwest communities.

Communities, agencies, and organizations contract with CPW to receive assistance on a variety of planning and public policy issues. Over the years, CPW has been asked to provide assistance on such topics as community and economic development, economic and market analysis, facility management, tourism, social services, recreation, housing, transportation planning, natural hazards, land use, and energy analysis.

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Executive Summary

This report presents a descriptive analysis of the relationship between shoreline development trends and the Klickitat County Shoreline Management Program. This analysis includes a description of the Shoreline Management Program and other regulations that affect shoreline development in Klickitat County, a description of existing development conditions, quantitative analysis of permit data and aerial photos, and conclusions.

Background

The Washington State Legislature passed the Washington Shoreline Management Act (SMA) in 1971. The public adopted the SMA by referendum in 1972. The purpose of the Act is “to prevent the inherent harm in an uncoordinated and piecemeal development of the state’s shorelines.”¹ This legislation requires every county and many cities to develop a Shoreline Master Program (SMP) to govern development in shoreline areas.

Development in shoreline areas in Klickitat County is guided by four regulations: 1.) the Klickitat County SMP; 2.) County Zoning; 3.) the Floodplain Ordinance; and 4.) the Critical Areas Ordinance.

In summary, the SMP regulates development along identified Shorelines of Statewide Significance. The SMP promotes water dependant uses in shoreline areas over uses that can be easily placed outside of shoreline areas.

Purpose and Methods

Shoreline development may have adverse implications for the environmental health of the area and, thus, for fisheries. The Yakama Nation have reserved treaty rights to harvest fish in rivers and streams throughout the Columbia River Basin. In Klickitat County, the Tribe is especially concerned with the impact of development on water quality and fish populations along Klickitat and Little Klickitat Rivers. In the future, the Yakama Nation may use the quantitative data in this report to create a computer model to monitor and plan fish habitat restoration projects.

To better understand development (i.e., residential, agricultural, etc.) patterns along shorelines CPW conducted a post-hoc analysis of development activity. A post-hoc analysis seeks to link actions or events with later outcomes. In this case, implementation of the SMP

¹ Washington Revised Code, Title 90, Section 58.

(cause) has influenced the character and extent of shoreline development (effect).

To analyze the link between the SMP and shoreline development, CPW:

- Identified quantitative indicators that illustrate the effectiveness of the SMP; and
- Analyzed these indicators to describe the relationship between shoreline development and the SMP.

The analyses performed for this report include, 1) phone interviews with key stakeholders; 2) analysis of permits issued for shoreline development; and 3) analysis of existing development and potential for future development in shoreline areas.

In summary, this report presents a descriptive analysis of development activity within the shoreline environments in Klickitat County. It is not a full-scale evaluation of the Klickitat County SMP.

Findings

This section summarizes the key findings of the stakeholder interviews, permit analysis, and development impact analysis.

Stakeholder Interviews

CPW interviewed people identified as key stakeholders to provide qualitative accounts regarding implementation of the SMP.

- Generally, stakeholders agreed residents are unfamiliar with the regulations and policies of the SMP.
- Stakeholders agreed the SMP is an effective tool for managing shoreline development.
- Stakeholders agreed that better funding and increased staff would improve the quality of SMP implementation.

Permit Analysis

Both Klickitat County and the Washington Department of Ecology (DOE) review permit applications. The Washington Department of Ecology provided CPW a database of permit applications from 1972-2004. Key findings from this analysis include:

- Shoreline development is a small percentage of development in Klickitat County – only 3.5% of structures built from 1972-1998 were built in shoreline areas. However, the shoreline areas are experiencing a higher rate of growth (2-17 times) than development countywide.
- Wetlands are addressed in 8 of the 121 permit applications. In the past, the County required applicants to self-report

wetlands when applying for permits. The adoption of the Critical Areas Ordinance in 2004 requires the County to identify wetlands for applicants.

- None of the permits in the database indicated any enforcement action. However, CPW learned of two cases of enforcement. Enforcement is only taken when a concerned citizen submits a signed complaint.

Development Impact Analysis

CPW located and categorized structures, roads, and wetlands, using digital aerial photos from 1996 and 2002, as well as wetlands data. Key findings from this analysis include:

- Within the shoreline areas regulated by the SMP (200-foot buffer zone), 91 individual structures existed in 1996 and 129 structures in 2002, an increase of 38 structures (29%) in six years.
- Residential structures are the predominant structure type within the 200-foot buffer, with 90 residences in 2002, a 20% increase from 1996.
- Of the structures in shoreline areas (within 200 feet of a river) in 2002, less than 20% were within 100 feet of the river and less than 6% were within 50 feet of the river.
- A total of 36 miles of road are within 200 feet of the Klickitat or Little Klickitat River; of these 36 miles of road, the road is distributed relatively equally in the 50-, 100-, and 200-foot buffers.
- 72% of structures (355) within 500 feet of the Ordinary High Water Mark are also located less than 300 feet from wetlands.
- Seven structures are situated on wetlands identified in the National Wetlands Inventory.

Recommendations

Based on the findings and conclusions of the SMP analysis, CPW identified opportunities for the Yakama Nation, DOE, and County to improve implementation of the SMP.

Yakama Nation. As co-manager of the Klickitat and Little Klickitat Rivers, the Yakama Nation has a vested interest in the impact of development on Trust resources and activities affirmed through treaties with the federal government. CPW recommendations for the Tribe include:

- *Monitor development permits in areas of interest.* The Tribes can work with the DOE or the County to monitor development permits throughout the County.
- *Acquire needed data for future evaluation efforts.* The Tribes should consider acquiring the following data to improve future analyses, including detailed GIS and tax-lot spatial data.

WA Department of Ecology. The DOE plays an integral role in the regulation of shoreline development throughout Klickitat County. To enhance the oversight role of the DOE, CPW recommends improving the management of the permit database and acquiring relevant spatial shoreline data. CPW recommendations for the DOE include:

- ♦ *Require more detailed information for all County shoreline permits to enhance the utility of the permit database.* The DOE should require tax-lot information, permit purpose, and conditions imposed for each permit in the database.
- ♦ *Publish biannual reports that include the number and type of shoreline permits issued, wetland mitigation actions taken, and all development within shoreline zones.* DOE should publish biannual reports to facilitate evaluation processes.

Klickitat County. Klickitat County uses its governmental authority to regulate development throughout the County. Inherent to this authority is the responsibility to update management plans to adhere to state guidelines, to monitor the effectiveness of existing policies and regulations, and to maintain a fair and efficient permitting process. Based on CPW's analysis of the SMP, Klickitat County has earnestly implemented the regulations set forth in the SMP.

Based on our analysis, CPW makes the following general recommendations:

- ♦ *The SMP should be revised to better integrate with the Critical Areas Ordinance (CAO) adopted in 2004.*
- ♦ *The County should enhance its role in the monitoring and enforcement of the SMP.*

Chapter 1

Introduction

The Confederated Tribes and Bands of the Yakama Nation are interested in the impact of development on water resources and fish populations along the Klickitat and Little Klickitat Rivers. To help gauge the effectiveness of existing shoreline regulations, the Yakama Nation hired the University of Oregon's Community Planning Workshop (CPW) to perform a baseline analysis of the Klickitat County Shoreline Master Plan (SMP).

This report presents a descriptive analysis of the Klickitat County SMP. The analysis provides a description of the regulatory context in which the SMP operates; an assessment of past, current, and future development patterns in Klickitat County; a quantitative analysis of County permit data, aerial photos, and County and state-level spatial data; and CPW's conclusions and recommendations.

Background

The Yakama Indian Reservation totals 1.2 million acres and is located in south-central Washington. Mt. Adams and the Yakima and Klickitat rivers are defining features of the reservation. In the 1855 Yakama Treaty with the federal government, the tribe ceded 11.5 million acres in exchange for reserved treaty rights throughout the region.

The Yakama Nation co-manages the Columbia, Wind, White Salmon, Klickitat, Yakima, Wenatchee, Methow, Entiat and Okanogan rivers along with the federal and state government. The Yakama is one of four tribes in the Columbia River Basin that has reserved rights to anadromous fish through 1855 treaties with the federal government. The 1855 Yakama Treaty assures the Yakama of the exclusive right to fish on and off the reservation at all "usual and accustomed places."² For this reason, the Yakama have been and continue to be concerned and involved in the management of water and fish resources in the Columbia River Basin.

The passage of the Washington Shoreline Management Act (SMA) (RCW 90.58) in 1972 established guidelines by which cities and

² The Center for Columbia River History, <http://ccrh.org/comm/river/harvest.htm> (accessed June 2, 2005).

counties across the state are required to manage shoreline areas through Shoreline Management Programs (SMPs). The primary goal of the SMA is “to prevent the inherent harm in an uncoordinated and piecemeal development of the state’s shorelines.”

The SMA legislation, in addition to other regulatory layers for environmentally sensitive areas, intends to protect critical water resources and habitat. In Klickitat County, the implementation and enforcement of such legislation may positively or negatively affect resources of tribal interest, specifically water resources and fish populations.

Why is this study important?

The Yakama have reserved treaty rights to harvest fish in rivers and streams throughout the Columbia River Basin. In Klickitat County, the Yakama Nation is especially concerned with the impact of development on water quality and fish populations in the Klickitat and Little Klickitat rivers. Unregulated, illegal development may have adverse implications for the environmental health of the area and, in turn, for tribal cultural traditions and economic resources:

- *Environmental impacts.* While dispersed development on a rural landscape may have a minor impact on the environment, over time, the accumulation of such development may have a major impact on the natural resource base within a watershed (Weiler and Theobald 2003). Negative environmental impacts may include the introduction of exotic species, a decrease in biodiversity, the disruption of wildlife habitat, and the suppression of natural processes such as flood and fire. For water resources, development may adversely affect water quality, habitat structure, flow regime, food sources, and biotic interaction (see Appendix B for more detailed discussion).
- *Cultural traditions.* Salmon is central to the spiritual and cultural identity of several Pacific Northwest Indian tribes. Salmon are an integral part of tribal religion, culture, and physical sustenance. The annual return of the salmon provides opportunities for the transfer of cultural knowledge, the celebration of life, and the harvest of an essential component of Indian health and diet.³
- *Economic resources.* Historically, the Columbia River Tribes were considered wealthy because of a flourishing trade economy based on salmon. Today, salmon and other fish still provide Indian tribes with economic benefit through individual Indian-owned businesses and tribal enterprises.

³ The Columbia River Intertribal Fish Commission, <http://www.critfc.org> (accessed June 3, 2005).

Several Indian tribes have successful fisheries programs that employ tribal and non-tribal members. The Yakama Nation operates a fisheries program with approximately 40 employees.

This study is important because of the adverse implications unregulated and illegal development may pose for the environment and, in turn, tribal cultural and economic resources. CPW's baseline analysis will contribute to the efforts of the Yakama to develop a descriptive model that gauges the impact of development on the levels of harvestable fish along the Klickitat and Little Klickitat rivers.

What is the purpose of the study?

The purpose of this study is to examine development along the Klickitat and Little Klickitat rivers in the context of Klickitat County's SMP and related regulations. The study consists of a review of the legislation and regulations that affect shoreline development; an analysis of the County permit database; a spatial analysis of the development in the study area relative to shoreline designations, specifically looking at wetlands, structures, and roads; and, an assessment of past, current, and future development patterns.

Report Organization

This report is organized into the following chapters:

- *Chapter 2: Regulatory Context: Klickitat County SMP* – Discusses legislation and regulations that guide shoreline development in Klickitat County.
- *Chapter 3: Framework for this Analysis* – Describes the analytical framework for this study.
- *Chapter 4: Permit Analysis Findings* – Describes the analysis of the permit database and the distribution of development in the study area.
- *Chapter 5. Development Impact Analysis* – Provides the findings from the development impact analysis of County zoning, shoreline designations, structures, roads, and wetlands.
- *Chapter 6. Recommendations* – Presents CPW recommendations for the Yakama Indian Nation, the Klickitat County SMP, and the Department of Ecology.

This report also includes several appendices:

- *Appendix A. Development Impact Analysis Methodology* – Outlines the GIS spatial analysis methods employed for this report.

- *Appendix B. Development Impacts Literature* – Provides a review of literature addressing environmental impacts of development.
- *Appendix C. Klickitat SMP Section 3* – Presents the SMP descriptions of Shoreline Environment Designations.
- *Appendix D. Permit Evaluation Process* – Describes the process by which the County reviews, issues, conditions, and denies permits.
- *Appendix E. County Zoning Summary* – Provides a summary of County Zoning in the study area.
- *Appendix F. Summary of Klickitat County Energy Overlay Zone FEIS* – Presents environmental mitigation measures identified for energy facility development.
- *Appendix G. Shoreline Regulations* – Compares the purpose, jurisdiction, and approach of the SMP, Critical Areas Ordinance, and Flood Plain Ordinance.
- *Appendix H. DOE Exemption Letters* – Reviews six permit exemption letters from the Klickitat County Planning Department to DOE.
- *Appendix I. Road Analysis* – Presents findings of road development in shoreline zones.
- *Appendix J. Wetland Definition* – Presents the U.S.F.W. definition of wetlands.

Chapter 2

Regulatory Context: Klickitat County Shoreline Master Program

Shoreline areas serve significant ecological functions and provide communities with unique wildlife habitat; recreational and economic development opportunities; and important amenities such as electricity and water for residential, commercial, industrial, and agricultural uses. In 1972 Washington State passed the Shoreline Management Act, which aims to protect diverse shorelines areas from poor management through the development of city and county shoreline master programs.

This chapter discusses the regulatory context of the Klickitat County Master Shoreline Program. It begins with an overview of the Washington Shoreline Management Act, explaining the general purpose and requirements of Shoreline Master Programs. Next, the Klickitat County Shoreline Master Plan is presented and the implementation and enforcement of the Shoreline Master Program are discussed. The chapter closes with a discussion of other state and federal regulations that influence shoreline development in Klickitat County. This section addresses the Washington Growth Management Act and its relationship to the Shoreline Management Act, specifically highlighting the Critical Areas Ordinance.

Washington's Shoreline Management Act

The Shoreline Management Act (SMA) (RCW 90.58) was adopted by the State of Washington in 1972. The primary goal of the SMA is “to prevent the inherent harm in an uncoordinated and piecemeal development of the state’s shorelines.” The SMA sets broad policy goals to give preference to shoreline uses that:

- Protect and preserve water quality and the natural environment;
- Depend upon proximity to shoreline areas (or are “water dependent”); and
- Protect and enhance access and recreational opportunities for the public in shoreline areas.

Following the broad policy goals and guidelines of the SMA, cities and counties across Washington State that have “Shorelines of Statewide Significance” (see definition below) are required to adopt shoreline master programs that are tailored to community

resources and needs. To date, more than 200 cities and all of Washington's 39 counties have shoreline master programs.

What are Shoreline Master Programs?

In developing shoreline master programs (SMPs), cities and counties must follow state guidelines as set out by the Revised Code of Washington (RCW) 90.58 and Washington Administrative Code (WAC) 173-26. SMPs combine both plans and regulations. In essence, the SMP acts as a comprehensive plan and zoning ordinance that is specifically oriented toward the protection of shoreline areas. The plans set policy goals and objectives that create a vision of how shorelines will be used and developed over time. Regulations specify the uses allowed in shoreline areas and establish standards to ensure the environmental integrity of the shoreline environment is protected and enhanced.

Where does the SMA apply?

Statewide, the SMA applies to more than 20,000 miles of shorelines including 2,300 miles of lakeshores, 16,000 miles of streams, and 2,400 miles of marine shoreline.⁴ The SMA specifically applies to:

- All marine waters;
- All streams with a mean annual flow greater than 20 cubic feet per second;
- Lakes, impoundments, and reservoirs larger than 20 acres;
- Upland areas (or "shorelands") extending 200 feet landward from the ordinary high water mark (OHWM) or floodways; and
- Wetlands (marshes, bogs, and swamps) and river deltas located within the 100-year floodplain.

The SMA also designates "Shorelines of Statewide Significance," or shorelines that are recognized as important to the citizens of the state. These shorelines require additional consideration in the decision-making process and often require goals of their own. The shorelines of the state defined in the SMA include:

- Pacific Coast, Hood Canal, and certain Puget Sound shorelines;
- All waters of Puget Sound and the Strait of Juan de Fuca;
- Lakes or reservoirs with more than 1,000 surface acres;

⁴ The Washington Department of Ecology, "Introduction to Washington's Shoreline Management Act," http://www.ecy.wa.gov/programs/sea/sma/st_guide/intro.html (accessed May 18, 2005).

- Larger rivers (1,000 cubic feet per second or greater for rivers in western Washington, 200 cubic feet per second and greater east of the Cascade Mountains); and
- Wetlands associated with all of the above.⁵

How is the SMA administered?

The SMA is administered through a cooperative program between local governments and the Department of Ecology (DOE). Local governments are required to develop SMPs and regulate development along shoreline areas per SMA guidelines. The DOE provides local governments with technical assistance throughout the development and revision of SMPs. SMP amendments are only effective after DOE approval.

The DOE is also involved in the permit decision-making process to ensure consistency with local master programs and the guidelines, policies, and regulations of the SMA. As of 2003, the DOE is required to approve or deny all conditional use (CUP) or variance permits.

Klickitat County Shoreline Master Program

Klickitat County adopted its SMP in 1975 and updated the plan in 1979, 1990, and 1996. Although the County SMP requires reviewing and updating the SMP at least once every two years,⁶ the County applies and enforces the policies and regulations set forth in the 1996 SMP to meet SMA guidelines. Klickitat County updated the SMP to:

- Ensure appropriate development along the shorelines of statewide significance;
- Reflect changing regulations and improve implementation and compliance;
- Improve the comprehensibility of the plan and ensure consistency in implementation;
- Reduce duplication between various levels of government and streamline the permitting process; and
- Improve the predictability of proposed activities within affected shoreline areas.

⁵ The Washington Department of Ecology, "Introduction to Washington's Shoreline Management Act," http://www.ecy.wa.gov/programs/sea/sma/st_guide/intro.html (accessed May 18, 2005).

⁶ The Klickitat County SMP states that the County is "responsible for reviewing and updating the Plan at least once every two years." However, in 2003 SSB 6012 established a coordinated update schedule that requires all counties to update SMPs once every seven years. Klickitat County is required to update its SMP in 2014.

The 1996 SMP update aimed to continue to protect the natural qualities of the rivers throughout Klickitat County, specifically the shorelines of the state along the Columbia, Klickitat, and White Salmon Rivers and Trout Lake Creek. The Update also aimed to meet the baseline requirements and goals for the Wild and Scenic Rivers Act and the Columbia River Gorge National Scenic Area.

A major revision of the SMP included the re-examination and designation of shoreline environments. To plan and effectively manage shoreline resources, the SMP designates six environmental zones, including:

- *Natural Buffer Zone*: Acts as a conservation buffer in all environments with a setback of 50 feet from the OHWM.
- *Natural Environment*: Preserves natural resource areas that are relatively free of human influence and are of particular wildlife habitat, scientific or educational, or scenic or recreational value.
- *Conservancy Environment*: Protects environmentally sensitive areas, but allows for low-intensity development.
- *Rural Environment*: Protects agricultural uses and maintains open spaces, but allows low-density residential development and limited recreational uses.
- *Community Environment*: Encourages residential, recreational, and commercial development characterized by limited extension of public services.
- *Urban/Industrial Environment*: Provides for high-intensity manufacturing, commercial, industrial, and residential uses.

A more detailed discussion of shoreline environment zones is presented in Appendix C.

Shoreline Master Program Implementation

The SMP is implemented through a permitting process established by the local government. The permit-evaluation process requires an extensive review of the application to ensure compliance with shorelines-of-the-state management policies (if applicable); shoreline environmental designation use regulations; state and federal environmental management policies; Shoreline Use Element policies; and other relevant local, state, and federal policies and regulations. See Appendix D for a concept model of the permit-evaluation process.

If the development is not exempt,⁷ local governments can issue three types of permits to allow development compliant with SMP policies and regulations:

- *Substantial Development Permit (SDP)*: Required for projects costing over \$5,000, or those that materially interfere⁸ with the public's use of the shorelines of the state. The permit may be conditioned to ensure consistency with existing land uses.
- *Conditional Use Permit (CUP)*: Granted to give special consideration to projects that may not be an outright permitted use or activity as defined by the SMP. The proposed use must be compliant with SMA and local SMP policies; not interfere with normal public use of the shoreline; be compatible with surrounding uses; not cause unreasonable adverse effects; and uphold the public interest.
- *Variance permit*: Allows a project to deviate from SMP regulations on dimensional standards such as setbacks and height restrictions. Variances may be granted if the applicant shows the permit is needed due to unique, unusual, or extraordinary circumstances that arise from conditions inherent in the land. The project must be compatible with surrounding uses and not cause adverse effects to the shoreline. The variance must not be considered a special privilege and must be the minimum necessary to relieve the identified hardship.

After the local government issues the permits, the DOE has 21 days to review SDPs, and 30 days to review CUPs and variance permits. The local government has the authority to approve SDPs, but the DOE may appeal the decision to the Shoreline Hearings Board. The DOE must approve or deny all CUPs and variance permits. The DOE may impose additional conditions to ensure development is in coordination with the surrounding area and broader SMA goals. The County or applicant may appeal the decision to the Shoreline Hearings Board.

⁷ The SMA exempts certain developments from the need to obtain an SDP including: single-family residences; normal protective bulkheads for single-family residences; normal maintenance and repair of existing structures; docks worth less than \$2,500 (salt water) or \$10,000 (fresh water); normal farming activities; and emergency construction needed to protect property. Exempted activities must still comply with all substantive policies and regulations of the SMP.

⁸ Development that "materially interferes" inhibits public access, use, and viewing of the shorelines of the state. Such "material interference" may include man-made structures such as houses, gates, docks, or revetments.

Enforcement Procedures

Under Washington State law, local governments are permitted to take necessary actions to ensure compliance with the SMA and local SMPs. In Klickitat County, the SMP is enforced through a complaint-based system; if citizens do not file complaints regarding illegal or conspicuous development, the County does not actively enforce the SMP or check up on permitted development. This process is reactive by nature and may foster illegal development if local citizens are unaware of SMP development regulations and the complaint-based enforcement system.

Local governments determine the appropriate type and level of enforcement; enforcement programs may consider a number of functions including:

- Response to complaints;
- Inspection and investigation of violations;
- Determination of SMA and SMP compliance;
- Documentation and record keeping;
- Coordination of local, state, and federal agencies;
- Determination of corrective action or restoration;
- Negotiation with violators;
- Provision of support appeals;
- Education of the public; and
- Regulation of communities.⁹

Counties and cities have several legal tools that can be used to enforce SMP regulations. Some common enforcement tools include:

- *Warning Notice.* A county may issue a written or oral warning that gives violators an opportunity to comply voluntarily. Written notices can be used as a follow up to verbal notices; a written notice should describe the problem and recommend an action to be taken by the recipient.
- *Cease and Desist (Stop-work order).* Stop-work orders can be issued if construction is in violation of regulations. The work orders must describe the violation and its potential damage, recommend corrective actions, and state the time allowed for

⁹ The Washington Department of Ecology,
<http://www.ecy.wa.gov/pubs/95101/chap1.html#Local%20Enforcement%20Programs>
(accessed February 24, 2005).

correcting the action. These work orders may be particularly effective if the development is constrained by seasonal work.

- *Civil Penalties.* State law allows local governments to impose fines up to \$1000 per day per violation for persons who fail to acquire a permit for shoreline development or who ignore a stop-work order. Such monetary penalties may be a disincentive for individuals to pursue illegal development activities.
- *Property Lien.* A lien is a charge or encumbrance against one's property. Jurisdictions may place a lien on a property if the owner fails to pay penalties associated with shoreline violations. A lien may be an effective tool to encourage property owners to pay penalties because it greatly reduces the utility of the property—it cannot be sold or used as collateral.
- *Liability for Restoration and Corrective Action.* Property owners who violate shoreline regulations are liable for damages to all private and public property and can be required to pay for restoration activities. This tool may be effective when shoreline resources and wetlands are involved.¹⁰

Other Shoreline Regulations

There are several local, state and federal environmental, natural resource and shoreline policies that play a regulatory role in the shoreline-permitting process. The regulations discussed in this section include the County zoning, Critical Areas Ordinance, Floodplain Ordinance, and a variety of state and federal regulations.

County Zoning

County zoning regulations establish a foundation for the location, type, and intensity of development.¹¹ Regulations set forth by the Critical Areas Ordinance (CAO), Floodplain Ordinance (FPO), and SMP are considered overlay regulations that provide a greater degree of protection for riparian areas than existing zoning requirements. This project focuses on reaches of the Klickitat and Little Klickitat Rivers, which include the following County zoning classifications:

¹⁰ Department of Ecology, "Enforcing the Shoreline Management Act: Guidance for Local Government Administrators," July 1998, Publication No., 95-101, available on-line at <http://www.ecy.wa.gov/pubs/95101.pdf> (accessed May 25, 2005).

¹¹ Klickitat County Zoning Ordinance, <http://www.klickitatcounty.org/Planning> (accessed May 31, 2005).

- *Suburban Residential (SR); Residential (R)*: Provides for low-to-medium density rural residential development consistent with the physical characteristics of the area.
- *General Rural (GR); Rural Residential 2 (RR2)*: Maintains the rural character of the countryside through large-lot zoning (two to five acres) and allows for a range of rural activities from agricultural production to forest uses.
- *Open Space (OS)*: Protects open space and the rural character of the land through large-lot zoning (20 acres) and provides for limited residential, agricultural, and recreational uses.
- *Rural Center (RC)*: Provides for industrial and commercial services in rural areas for the convenience of County residents.
- *Public (P)*: Provides for public uses such as school facilities or parks on publicly owned land that serve community or governmental functions.
- *General Industrial (GI); Industrial Park (IP)*: Provides for more intensive industrial uses essential to a balanced economic base and minimizes conflict between industry and other land uses.
- *Extensive Agriculture (EA)*: Encourages farming on lands best suited for agriculture and minimizes conflict between farm and non-farm uses.

A more detailed comparison of County zoning is presented in Appendix E.

Energy Overlay Zone

Klickitat County's natural and built environment¹² may facilitate the expansion of energy production facilities. For this reason, Klickitat County completed a Final Environmental Impact Statement (FEIS) for the Klickitat County Energy Overlay Zone in 2004. The County Energy Overlay Zone details the locations of potential energy projects. The FEIS outlines environmental issues associated with energy projects and addresses appropriate environmental impact review/permitting processes. The FEIS may inform future legislative actions and serve as a baseline environmental analysis for future energy projects. A review of mitigation strategies identified in the FEIS is provided in Appendix F.

¹² Klickitat County may capitalize on predictable wind, solar energy resources, an extensive electric transmission grid, a high-capacity natural gas pipeline, and biomass resources to expand energy production facilities.

Washington's Growth Management Act

In 1990 the Washington State Legislature passed the Growth Management Act (GMA) (RCW 36.70) in response to the uncoordinated and unplanned growth that characterized many cities and counties across the state. The GMA established a system of state-mandated comprehensive planning for the most populated and fastest-growing cities and counties of the state. The GMA requires local governments to manage growth through the identification and protection of critical areas and natural resource lands; the designation of urban-growth areas; and the preparation of comprehensive plans and development regulations.

The regulations set forth by the GMA and the SMA provide cities and counties with a host of regulations to preserve, protect, and enhance critical and environmentally sensitive areas. To clarify this complex relationship, the Legislature amended the GMA in 1995 to better integrate the two statutes. The 1995 amendments designated the goals and policies of a SMP as an element of a local government's comprehensive plan; and designated SMP regulations as a part of a jurisdiction's development regulations.

In 2003 the Legislature adopted additional regulatory reforms that further clarified the relationship between GMA and SMA regulations. The legislation (ESHB 1933) recognizes that though critical areas are to be identified and designated under the GMA, they are to be protected under the SMA. Each local government is required to amend SMP regulations to ensure a level of protection that is "at least equal" to the level of protection provided to critical areas by the local government's CAO under the GMA.¹³

To further enhance the coordination of the GMA and the SMA, the 2003 Legislature adopted a coordinated update schedule for CAOs and SMPs over a 20-year period. CAOs and SMPs are required to be updated every seven years. According to this schedule, Klickitat County is required to update its CAO by December 1, 2007. By 2014, the County must update both its SMP and CAO.

County Critical Areas Ordinance

Although not all counties in the state are required to participate in the state-mandated comprehensive planning process, the GMA (RCW 36.70A) mandates all counties to develop and adopt an ordinance that classifies, designates, and protects critical areas. In response to this mandate, counties across the state have adopted Critical Areas Ordinances (CAOs) that aim to protect, preserve, and

¹³ The Washington State Department of Ecology and Department of Community, Trade, and Economic Development, "Questions and Answers on ESHB 1933 Critical Areas Protection under the Growth Management Act and Shoreline Management Act," <http://www.ecy.wa.gov/programs/sea/sma/lawsrules/90-58/1933/guidance.pdf> (accessed May 19, 2005).

restore critical areas that may contain valuable natural resources; perform important ecological functions and processes; or, if developed, may present potential hazards to life and property.

Klickitat County's CAO was adopted in February 2001 and declared effective in January 2004. The CAO acts as an overlay to existing land-use regulations and applies to all activities (unless exempt), permits, and land-use appeals in unincorporated areas of the County. The CAO establishes performance standards for the following critical areas:

- Wetlands;
- Critical fish and wildlife habitat conservation areas;
- Geologically hazardous areas;
- Aquifer-recharge areas; and
- Frequently flooded areas.

Floodplain Ordinance

The Washington State Legislature requires every county to implement a floodplain ordinance (FPO) pursuant to RCW 36.70 to promote the public health, safety and welfare of the citizens and to minimize the public and private losses due to flood conditions. State law requires local entities to have a floodplain ordinance that meets or exceeds National Flood Insurance Program (NFIP) requirements that are established by the Federal Emergency Management Agency (FEMA).

Local governments that participate in the NFIP are required to review proposed development projects to determine if they are in identified floodplains as indicated by the FEMA Flood Insurance Rate Map (FIRM). If a project is located in a "special flood-hazard area," or the 100-year floodplain, the local government must ensure development permits are compliant with FPO regulations.¹⁴

Development subject to FPO regulations is also subject SMP and CAO regulations due to the location of the development within shoreline areas. Klickitat County last updated its FPO in 1988; for this reason, the CAO and the SMP both defer to the FPO in regulation of development in the floodways. The SMP specifically prohibits any development in floodways.

¹⁴ The Municipal Research and Services Center of Washington, <http://www.mrsc.org/Subjects/PubSafe/emergency/floodfema.pdf> (accessed February 16, 2005).

Additional Regulatory Layers

- The Dangerous Waste Management Act (RCW 70.105) regulates state hazardous waste.
- State law (RCW 75.20) requires hydraulics project approval to control water habitat impacts.
- Through a Memorandum of Agreement with the Environmental Protection Agency (EPA) and the DOE, Indian tribes may protect tribal resources through a Tribal Review Program.
- The Washington State Environmental Policy Act (SEPA) and National Environmental Policy Act (NEPA) require a process for public and environmental review of development proposals.
- Section 401 of the Clean Water Act regulates water-quality impacts.
- The National Pollution Discharge Elimination System (NPDES) regulates water quality of industrial and storm water discharges.
- The Hazardous Waste Management Act regulates federal hazardous waste.
- The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments Reauthorization Act (SARA) regulate the clean up and management of historically contaminated sites and the impacts of contamination on upland, wetland or marine habitat; air and water quality; and land resources.

Conclusion

The many layers of shoreline regulations in Washington State contribute to a complex regulatory framework that aims to protect shoreline environments from uncoordinated development and environmental degradation. The shorelines of Klickitat County are regulated by the SMP, FPO, CAO, and County zoning (see Appendix G for a comparison of the SMP, FPO, and CAO). A review of these regulations shows:

- The SMP has not been updated since 1996; it should be updated to acknowledge the complementary regulations of the CAO;
- The FPO was last revised in 1988; it should be updated to reference the SMP and the CAO; and
- In most cases, the SMP, CAO, and FPO regulate similar areas; regulations should be better coordinated to reduce

overlap and enhance consistency; specifically, the definitions of terms and concepts should be consistent for all regulations.

Therefore, pursuing development in shoreline areas in Klickitat County is a complex task, requiring compliance with a variety of regulations at the local, state, and federal level.

Chapter 3

Framework for this Analysis

Based on the Klickitat County Shoreline Master Program (SMP) implementation process CPW developed a framework to guide the study analysis. This chapter describes the theoretical framework for the analysis which begins with a logic model that illustrates the various inputs, outputs, and goals of the SMP. The logic model describes how CPW used the theoretical framework to identify the specific methods and indicators used in this study.

Type of Analysis

The Klickitat County SMP acts as a land-use guide, designating and regulating shoreline environments and uses permitted within those environments. CPW conducted a post-hoc analysis of development activity in areas regulated by the SMP. A post-hoc analysis evaluates the links between actions and outcomes. From a theoretical perspective, the implementation of the SMP (cause) should have influenced the character and extent of shoreline development (effect). CPW developed a study approach that:

- 1) identified quantitative indicators to illustrate the amount of development activity in areas regulated by the SMP; and
- 2) analyzed these indicators to describe the relationship between shoreline development and the SMP.

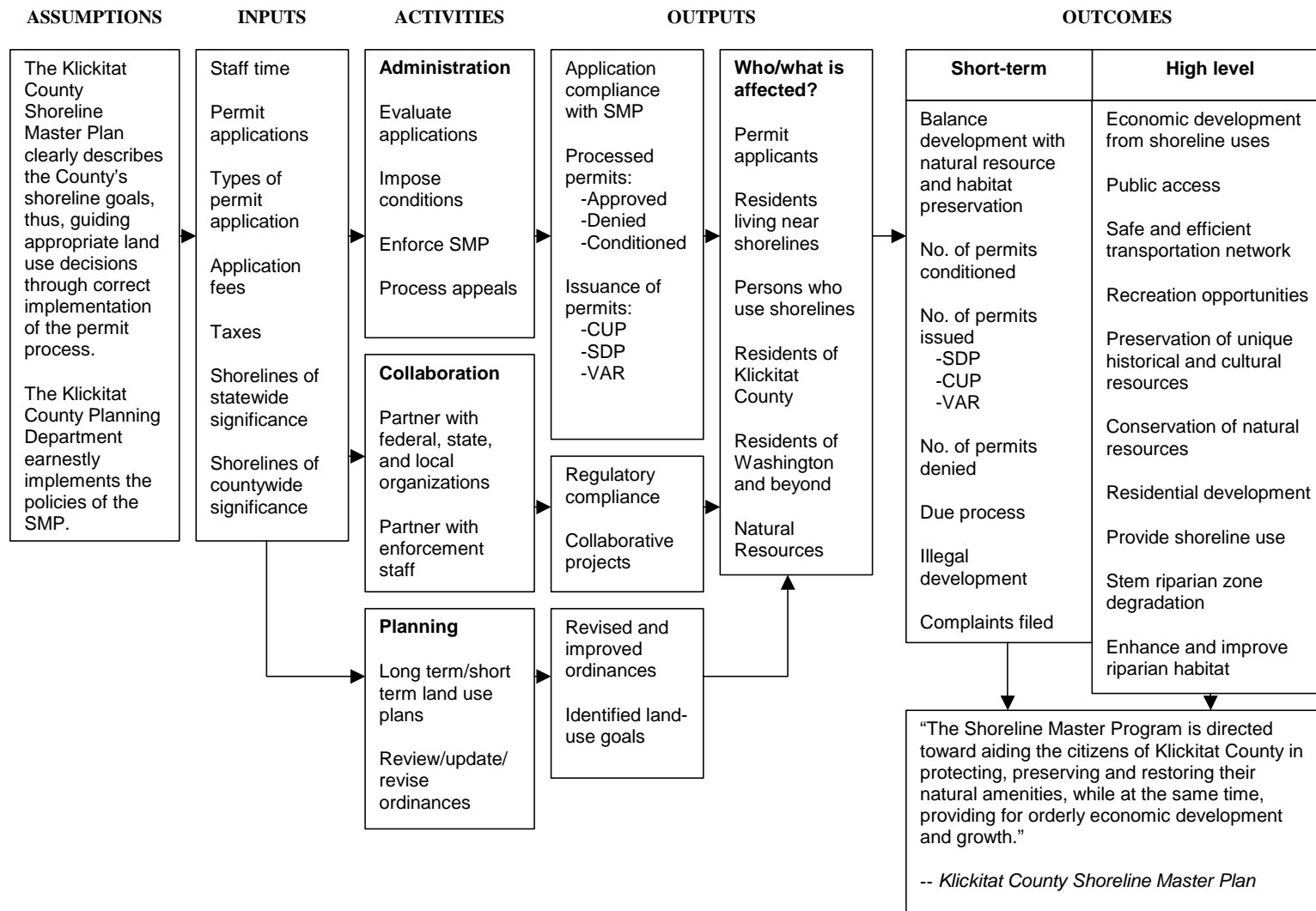
CPW's analysis of Klickitat County's SMP cannot be considered a formal evaluation. The study is limited by the availability of data and access to properties. The data used for this analysis did not include geographic locations where shoreline permits were issued. Thus, it was not possible to link development to any given permit. As such, CPW is unable to comment on whether any individual structure observed on the ground is not compliant with SMP regulations. In short, this study as a descriptive analysis that provides empirical data on the rate and location of development in the shoreline area, but for the most part does not tie that development back to SMP regulations.

Shoreline Master Plan Logic Model

CPW created a logic model to provide a graphical representation of the shoreline permit process (Figure 3-1). More specifically, the logic model illustrates relationships and linkages between program inputs, activities and outreach efforts, and short- and long-term outcomes of those activities.

The logic model provides a theoretical construct of how the SMP is intended to work. CPW used the logic model to identify a set of indicators to analyze the SMP permit process. The indicators CPW used do not allow us to comment on many of the short-term or high level outcomes.

Figure 3-1. Logic Model for Klickitat County Shoreline Master Plan



The logic model displays seven components of the permit process:

- Assumptions
- Inputs
- Permit-process Activities
- Outputs
- Short-term Outcomes
- High-level Outcomes
- Goals

The following sections explain the seven components of the shoreline management planning/permitting process included in the logic model diagram (Figure 3-1). Each component of the process represents a step toward reaching the overall goals of the Klickitat County SMP.

Assumptions. Assumptions are used to determine the need for and design of the program. In this case, the assumptions are that the SMP clearly guides appropriate land-use decisions through implementation of the permit process and that the Klickitat County Planning Department earnestly implements the SMP.

Inputs. Inputs of the permit process include staff time, shoreline permit applications, application fees, taxes, and the Shorelines of Statewide Significance.

Activities. Inputs make permit-process activities possible. The permit process entails three functions: administration, collaboration, and planning activities. Administration activities involve reviewing applications, imposing conditions, enforcing the SMP, and processing appeals. Activities involving collaboration efforts include: partnering with federal, state, and local organizations and enforcement staff. Planning activities include: creating and revising the SMP, and reviewing/updating/revising ordinances that complement the SMP.

Outputs. The activities conducted during the SMP permit process produce outputs that lead to the outcomes and goals of the program. Outputs include: reviewed and issued permits; regulatory compliance; collaborative projects; revised and improved SMP policies, ordinances, and plans; and identified SMP goals.

Short-term Outcomes. Immediate outputs lead to two levels of outcomes: short-term and high-level. Short-term outcomes include: a balance of development with natural resources and habitat preservation, permits conditioned and issued (Substantial Development, Conditional Use, and Variance Permits), permits denied, and complaints filed.

High-level Outcomes. Short-term outcomes lead to high-level outcomes based on the SMP goals¹⁵, including: (1) economic development; (2) public access; (3) safe and efficient transportation systems; (4) recreation opportunities; (5) preservation of unique historical and cultural resources; (6) conservation of natural resources; (7) residential development; (8) provision of shoreline use; (9) preserved riparian areas; and (10) enhanced and improved riparian habitat.

Goals. Finally, the high-level outcomes of the permit process are the result of several programmatic goals of Klickitat County's SMP. The goals facilitate the protection, preservation, and restoration of natural amenities and the stimulation of economic growth and development throughout the County.

How CPW used the logic model

CPW collected data on each of the indicators listed below. Indicators are used to measure SMP-related activities. Data for these indicators were developed through a review of aerial images, shoreline development permit records, stakeholder interviews, policy research, and field observations. Based on the permit-process logic model presented above and available resources, CPW identified the following indicators to gauge the impact the Klickitat County SMP has had on development in the study area:

- Number and types of substantial development, conditional use, and variance permits;
- Number of permit applications processed;
- Number of permits issued by type;
- Number of permits denied;
- Types of permit conditions imposed;
- Types of enforcement actions;
- Permits with associated wetland mitigation;
- Number of structures within 300 feet of wetland;
- Location of structures within 200 feet and 500 feet of the Ordinary High Water Mark (OHWM) in 1996 and 2002;
- Types of structures within 200 feet of OHWM in 1996 and 2002;
- County Zoning designation of structures within 200 feet of OHWM;

¹⁵ Klickitat County Shoreline Master Program, 1996.

- Shoreline Environment Designation of structures within 200 feet of OHWM;
- Total road length by type within 200 feet of the OHWM in 2002; and
- Total impact area per road type for each reach within the 200-foot buffer.

By measuring each of the indicators included here, CPW was able to assess the outputs and outcomes of the Klickitat County Shoreline Master Program. Data came from several sources including:

- *Department of Ecology (DOE) permit database.* The DOE database provides a record of all permits that have been requested for development along shorelines of statewide and countywide significance. CPW used the database for quantitative analysis of types and numbers of permits issued as well as why some permits were conditioned, approved, or denied.
- *Stakeholder interviews.* CPW conducted 15 interviews with stakeholders who represented government officials, real estate agents, and non-profit organizations. These interviews provided a qualitative, in-depth look at implementation of the SMP.
- *Geographic Information Systems (GIS) data.* CPW used GIS data from the DOE, the Washington State Department of Natural Resources, US Geologic Survey, Washington Department of Transportation, and the Yakama Indian Nation. These data were used to create maps for spatial analysis of shoreline development and for graphic display of data in this report.¹⁶
- *Field observations.* CPW visited the DOE in Yakima, Washington to review hard-copy versions of shoreline permits and to compare the DOE permit database entries with actual permit records. This research provided qualitative and quantitative information about the accuracy of the permit database. In addition, CPW conducted two site visits to the Klickitat and Little Klickitat Rivers to verify the accuracy of GIS and aerial photo interpretation presented in *Chapter 5*.

¹⁶ The methods of GIS analysis in this report are detailed in Appendix A.

Chapter 4

Permit Analysis Findings

This chapter provides a descriptive analysis of shoreline development permits issued in Klickitat County from 1972 to 2004. The Klickitat County Shoreline Management Program (SMP) establishes policies and regulations that are designed to avoid or minimize impacts to the environment from activities associated with human land-use activities in riparian areas. Development within the shoreline zone requires a development permit. Permit applications are intended to document and determine whether the proposed development is consistent with SMP regulations.

This chapter presents a descriptive analysis of the DOE permit database. While CPW found some inconsistencies in the database—and some permits that were missing—the analysis provides a relatively comprehensive overview of shoreline management permit activity in Klickitat County.

Methods

The Klickitat County Shoreline Master Program (SMP) regulates development in identified shoreline zones. Most development activities within the shoreline zones are subject to the policies and regulations set forth in the County SMP. Any substantial development¹⁷ requires a permit, which is reviewed by County staff and the Washington Department of Ecology (DOE).

The DOE maintains an electronic database of permits issued for development in shoreline areas in Klickitat County. The DOE database included 121 permit applications reviewed between 1972 and 2004. Of these 121 permits in Klickitat County, 43 (36%) were for development along the Klickitat and Little Klickitat rivers. While this study focuses on development activity along the Klickitat and Little Klickitat rivers, all Klickitat County permits were reviewed due to the small number of permits issued for the study area.

The DOE permit database includes:

- Year of the permit request

¹⁷ Substantial development is defined in the Klickitat SMP as “Substantial development shall mean any development of which the total cost or fair market value exceeds two thousand five hundred dollars, or any development which materially interferes with the normal public use of the water or shoreline of the state,” (Section 05-0010). The SMP then lists specific types of developments that are excepted from this definition.

- General location of permits from 1972-1998
- Permit type
- Local action taken
- DOE action taken
- Water body on which the property is located
- Limited details about the permit such as wetland mitigation actions and location of development relative to water body
- Enforcement actions associated with the permit request

To supplement the permit database, CPW reviewed the paper copies of permits at the DOE offices in Yakima, Washington. In analyzing the permit applications, CPW found information on appeals, denials, and conditions of permits. CPW also analyzed the enforcement procedures documented in the permit database; CPW specifically reviewed procedures for wetland enforcement.

Limitations

The structure and content of the DOE database presents some significant limitations to the permit analysis. The primary limitation is the incomplete nature of the database. Some of the fields are not filled out or include only partial data. For example, one partially completed field was the description of conditions required for each permit.

In addition to partially filled or missing fields, the database does not appear to contain all of the permits issued. Through field visits to the DOE, CPW identified at least five permits that were not included in the database but existed in paper form. Overall, CPW found that the paper-form permit applications were not prepared in a uniform manner, despite the fact that the County has a set of standardized application forms.¹⁸ This made it difficult to collect and analyze data in a uniform manner.

Finally, one of the greatest limitations of the database is the lack of specific geographic information. The database contains information about the township, range, and section, but no tax-lot information to determine where the permit was issued. Thus, CPW was unable to link permits with specific structures or development. Furthermore, the general geographic locations are only provided for

¹⁸In some respects, this finding is not particularly surprising—applications are typically prepared and submitted by property owners who have varying levels of knowledge about the application process. In many instances, County staff probably provided assistance to property owners in helping them submit a complete application with the required information.

permits from 1972-1998. None of the permit entries after 1998 identify the geographic location of the development.

Permit Activity

Shoreline development permits fall under one of three types (see *Chapter 2* for a description of permit types):

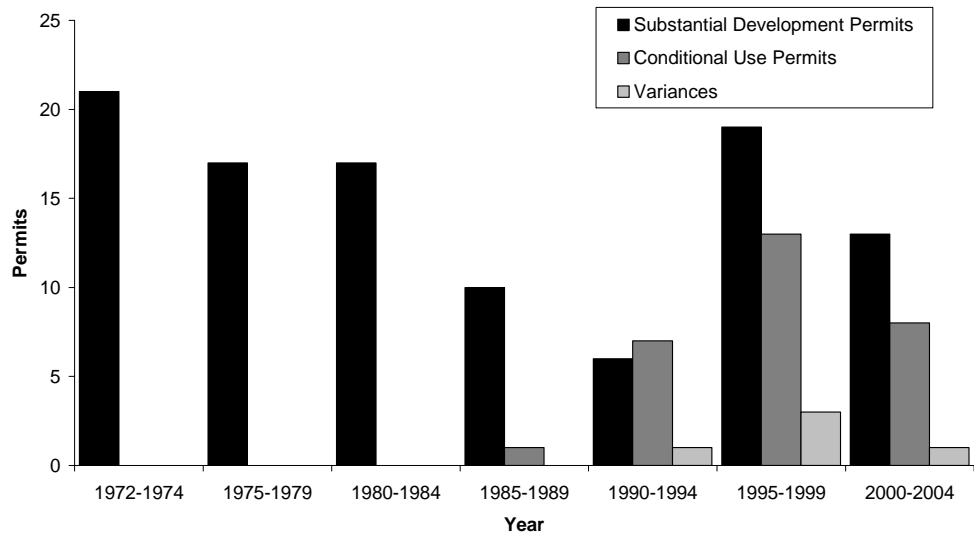
- Substantial development permits (SDPs) are issued for any development that meets SMP criteria and is allowed in the shoreline designation assigned to that property;
- Conditional use permits (CUPs); and
- Variance permits.

Shoreline permits are classified in the DOE permit database according to the type of water body associated with individual shoreline permits. The water body types help planners and administrators develop permitting conditions that address the unique conditions of the site. There are 16 water-body types including: river, lake, stream, strait, coulee, reservoir, swamp, pothole, lagoon, basin, slough, estuary, pond, creek, bay, and delta.

From 1972 to 2004, property owners submitted applications for 121 development permits in shoreline areas in Klickitat County. All permits issued prior to 1989 were SDPs. In 1989, Klickitat County started issuing CUPs and variances.¹⁹ Generally, more SDPs were issued than CUPs and there have been five variances issued (Figure 4-1).

¹⁹ In the late 1980s, DOE discontinued thorough review of SDPs due to heavy volumes and focused their efforts on CUPs and variances.

Figure 4-1. Permits issued by type, Klickitat County 1972-2004



Source: DOE Permit Database, 2005.

Of the permits requested, 91% were for development on a river or creek. Only 9% were for development on a lake, gorge, or stream²⁰ (Table 4-1). The large percentage of permits for rivers and creeks is most likely due to the amount of shoreline acreage associated with such water bodies as compared to lakes or gorges. Of the 92 permits for rivers, 46% were issued for the Klickitat River and the Little Klickitat. The remaining 54% of the permits were issued for the Columbia River and the White Salmon River (Table 4-2).

Table 4-1. Permits issued in Klickitat County by type of water body, 1972-2004

Water Body	Permits	Percent
River	92	77.3%
Creek	16	13.4%
Gorge	5	4.2%
Lake	4	3.4%
Stream	2	1.7%
Total	119	100%

Source: DOE Permit Database, 2005

²⁰ These water body classifications are based on the name of the water body.

Table 4-2. Permits issued in Klickitat County by body of water, 1972-2004

Waterbody	Permits	Percent
Klickitat River	33	27.5%
Columbia River	26	21.7%
White Salmon River	23	19.2%
Little Klickitat River	11	9.2%
Synder Canyon	8	6.7%
Trout Lake	7	5.8%
Rattlesnake	3	2.5%
Swale Creek	3	2.5%
Bowman Creek	2	1.7%
Buck Creek	1	0.8%
Bingen Lake	1	0.8%
Carp	1	0.8%
North Western Lake	1	0.8%
Total	120	1

Source: DOE Permit Database, 2005.

Table 4-3 shows that the largest percentage of permits issued in Klickitat County were for various types of construction (36%) followed by excavation and grading (13%). The County issued the rest of the permits for restoring or expanding existing structures or infrastructure and roadwork.

Table 4-3. Permits issued in Klickitat County by description of the permit, 1972-2004

Category or Work	Percent
Construction	36%
Excavation/Grading	13%
Remodel	11%
Preservation	9%
County/City Infrastructure	7%
Powerlines	7%
Unknown	7%
Reconstruction	4%
Roads	4%
Place Aerial Conveyor	2%

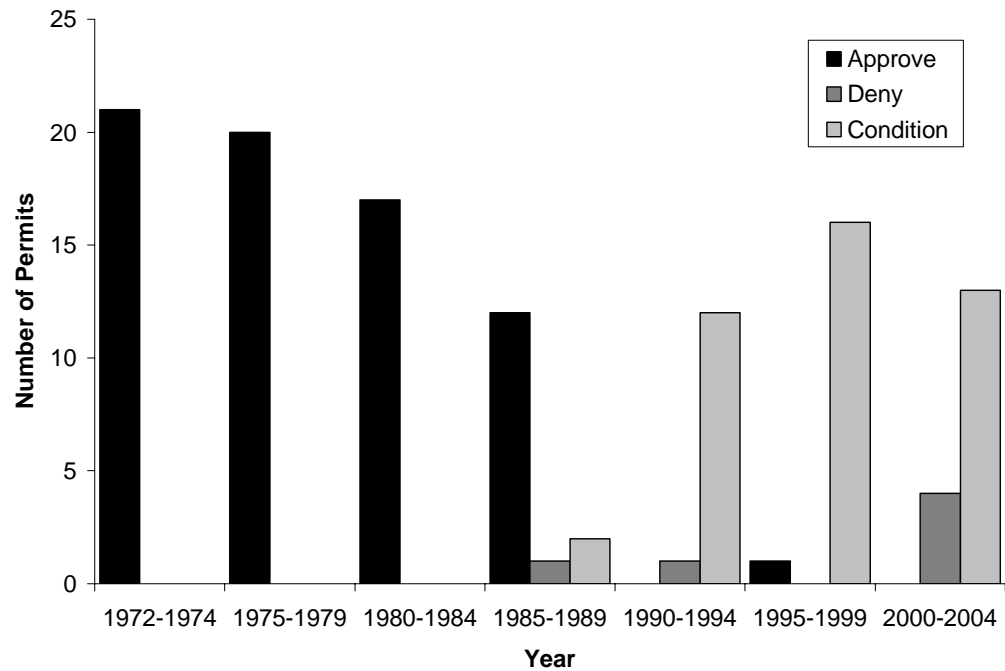
Source: DOE Permit Database, 2005.

Summary of Permits Denied, Conditioned, or Appealed and Enforcement Actions

The DOE database shows that Klickitat County approved, without conditions, all 67 permits requested prior to 1988. From 1988 through 2004, the County approved 43 permits with conditions and denied six permits. Since 1999, only one permit was unconditionally granted (Figure 4-2). This trend could be a result of the change in DOE's review process during the late 1980s; the DOE discontinued review of SDPs due to the heavy volume of permits.

This trend may also indicate a change in the way permits are recorded. CPW found only one permit that was appealed.

Figure 4-2. Action taken by Klickitat County for permit requests, 1972-2004



Source: DOE Permit Database, 2005.

Summary of Denied Permit Applications

Generally, permit applications were denied for two reasons:

- They violated the setback regulations; or
- They requested modifications to structures that were built illegally in the first place.

One permit application that was denied was for a SDP and a variance to replace a small cabin with one more than eight times the original size. The existing cabin was located 28 feet from the ordinary high water mark (OHWM). Regulations state that buildings must have at least a 100-foot setback from the OHWM. The permit was denied because there was not a unique situation or unnecessary hardship to justify relief from SMP regulations.

Another permit application requested a variance to remodel and expand a deck within the 100-foot setback of the OHWM. This

permit was denied because the existing structure had been built illegally.

Another denied permit application was a request to add a deck to an existing structure. This permit was denied for two reasons: the existing structure had been built illegally and the deck would violate the 100-foot setback.

One permit requested to install a septic system within the 100-foot setback on the White Salmon River. It was denied because it would impose on the setback regulations.

CPW was unable to identify the reasons the two final permit applications were denied.

Summary of Permits Conditioned

There is a high level of variation in the level of detail permit files describe conditions imposed on permit applications. Most applications after 1988 have conditions imposed, but the specificity of conditions varied between applications. CPW observed the following trends:

- The conditions as documented in the permit files generally are not specific or detailed. Only three of 43 permits conditioned in the permit database have conditions documented in the database.
- Some permit conditions merely reiterated the requirements of the SMP. Other permits provided more detailed conditions.
- Conditions often reiterate existing policies. For example, the most commonly imposed condition was “follow state and federal regulations.”
- It is not clear how well these conditions were met. The County does not perform site inspections for most of the permitted development. Sites are only inspected if a citizen signs a formal complaint.
- The County levied fines in only one instance where violations were documented.
- The County Planning Department often defers to the DOE for permit conditions. The DOE responds with specific conditions to ensure protection of the riparian zone.

Summary of Appealed Permits

CPW only identified one case where a permit was appealed. The permit was for a CUP and SDP to expand a mining operation to a point within 200 feet of the Columbia River. The site was, at the time, used as a barge landing that included dolphins (a conveyor loading system) and rock mining. The permits were approved, then,

later were appealed. While the documentation was not specific, it is likely the DOE appealed it. The results of the appeal are unknown.

This case signifies that appeals are rare, or rarely recorded, although any person who is aggrieved by the granting, denying, or rescinding of a permit on shorelines of the state may appeal the decision to the Shoreline Hearings Board within 21 days of filing the decision.

Enforcement Summary

The database indicates little enforcement action has been taken for permits issued between 1972 and 2004. The County has imposed enforcement measures, but these cases only appear in the paper copies of the permits. This indicates that regulatory actions are not recorded in the database field for enforcement action.

CPW found two paper copies of cases that included enforcement action. One case involved enforcement of DOE conditions on the construction of a rock berm. The other case involved un-permitted construction of Recreational Vehicle (RV) sites in the riparian zone at an RV park.

According to DOE staff, the DOE typically only monitors variances. Normally, DOE and a County planning staff members monitoring permits by visiting the site three years after the issuance of the permit. DOE does not check every permit issued, only those most likely to be out of compliance. They do not normally check SDPs because those applications are expected to be in compliance with the SMP.

A DOE staff member noted that limited staff and funding hinder the monitoring of illegal development. In some cases of identified illegal development, the DOE will work collaboratively with the County to take enforcement action.

Summary of Wetlands Information

Out of 121 permits, eight cases cited some sort of wetland impact or mitigation. Generally, there is little mention of wetland impact. The permit application requires the applicant to report the existence of wetlands on the subject site; a professional delineation is not required. Therefore, wetlands are likely under represented.

Summary of Exemption Letters

The Klickitat County Planning Department informs the DOE when property owners propose developments that are exempt from the shoreline permitting process. The DOE provided CPW with permit exemption information (letters), dated from August 2001 to October 2004 (Appendix H). We assume that exemption letters prior to August 2001, are likely stored at the State archives; CPW did not review these letters.

The six exemption letters analyzed are all for public or governmental agencies – primarily for road and shoreline improvements and maintenance. All of the exemptions have been conditioned to avoid impairing County shorelines. The exemptions allowed the public agencies to maintain or repair areas along waterways for the betterment and protection of both humans and wildlife. On the surface, none of the six projects appear to have impaired shorelines.

Distribution of Development

In order to describe development trends in Klickitat County, it is necessary to know where development has occurred. For this analysis, it is especially important to compare the intensity of development in shoreline areas to upland areas. CPW used data from the DOE permit database and the U.S. Census Bureau to determine the distribution of development in Klickitat County.

The DOE permit database of County shoreline permits provides a record of development from 1972 to 2004. The database also includes the township, section, and range for permits issued between 1972 and 1998. In addition to this data source, the U.S. Census Bureau collects information on housing units built each year. Using the geographic center of each section, CPW was able to compare the number of structures built in each Census block group and each Census-designated place with the number of shoreline permits issued in the same geographic area.

Methods

To describe the distribution of development between shoreline and upland areas of the study area, CPW calculated the percent of development that occurred in shoreline areas and divided it by the percentage of the area consisting of shoreline areas²¹. This indicator is called the Shoreline Development Quotient (SDQ):

$$\text{SDQ} = \% \text{ of shoreline development} / \% \text{ total shoreline area}$$

The *Shoreline Development Quotient* shows how much development has occurred in shoreline areas compared to what would have happened if all development were evenly distributed over the entire area. A Shoreline Development Quotient of 1.0 indicates that development is evenly distributed between shoreline and non-shoreline areas. A Shoreline Development Quotient less than 1.0 indicates less development occurred in shoreline areas than would have if development were evenly distributed. Similarly, a Shoreline Development Quotient greater than 1.0 indicates a higher rate of development in shoreline areas.

²¹ Shoreline Development Quotient = (%structures in shoreline area) / (%Area is shoreline)
= (#Structures in Shoreline Area / Total Structures) / (Shoreline Area / Total Area)

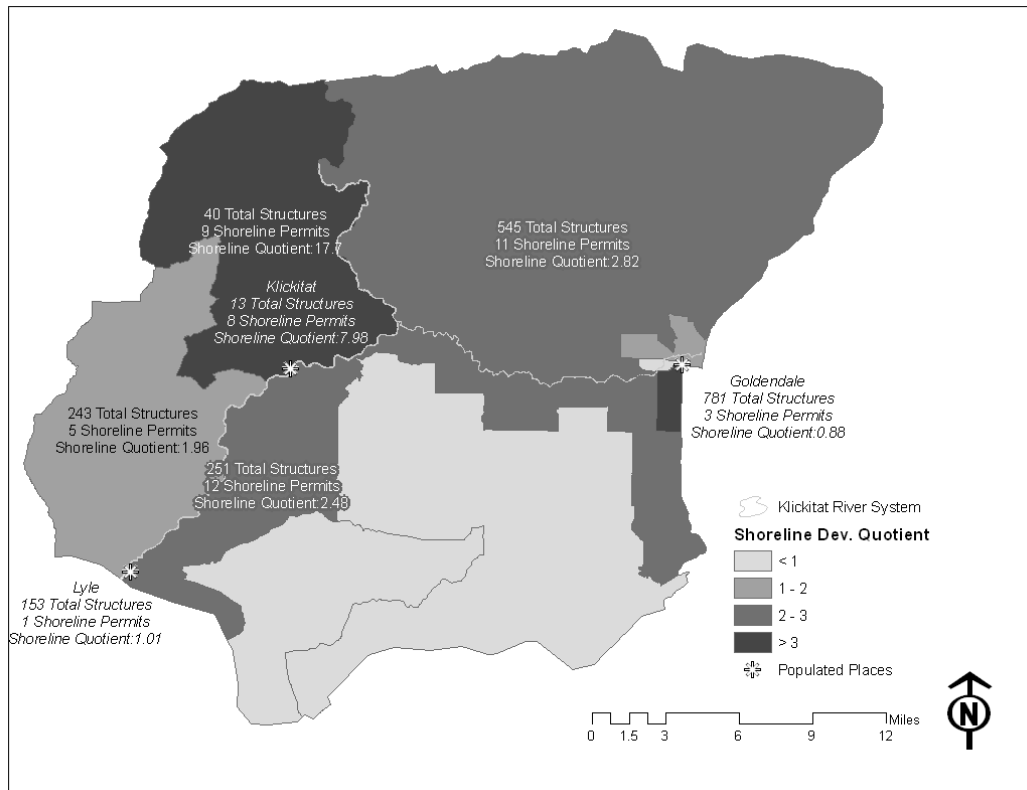
Data Limitations

The available years of data from the U.S. Census Bureau differ from the years in the DOE permit database. The Census Bureau provides data from 1970 to 2000 while the DOE database provides permit date from 1972 to 2004. In addition to this limitation, the DOE database does not include geographical location for any permit issued after 1998. Therefore, the Census data of total number of structures built includes four more years than the shoreline permit information available. The additional four years of census information produces a slight underestimate of the percentage of development occurring in shoreline areas. For the purposes of this analysis, however, an estimation of the percentage of development is sufficient to compare the distribution of development.

Development Impact Areas

Every Census block group along the Klickitat and Little Klickitat Rivers had a Shoreline Development Quotient greater than 1.0 except one block group in Goldendale, which is outside the study area (Figure 4-3). This finding suggests that more development is occurring within shoreline areas than outside them. In short, the results suggest that shoreline areas within the study area are an amenity that attracts development. This result is not particularly surprising given the topography of the study area and the fact that infrastructure tends to be located near shorelines.

Figure 4-3. Number of shoreline permits issued, total structures built, and shoreline development quotients by census block group, 1972-1998



Source: Washington DOE, 1972-1998; US Census Bureau, 1970-2000.

Numerically, most permits were issued for block groups on the east side of the Klickitat River and along the Little Klickitat River. However, the highest percentage of development in the shoreline area occurred on the west bank of the Klickitat River north of the City of Klickitat. This area has a Shoreline Development Quotient of 17.7. This indicates that shoreline areas along this section of the river have 17 times the development they would if development were evenly distributed between shoreline and upland areas. However, the high Shoreline Development Quotient is due to how few total structures were built in that block group. The isolation of the area probably results in fewer people building there. Since few roads access that area and Highway 142 runs along the river, land ownership, access, and infrastructure are probably significant limitations to development compared to areas closer to the highway.

The lowest Shoreline Development Quotient (1.96) in the study area was along the west side of the Klickitat River between the mouth of the river and the City of Klickitat. The other sections of the study area, the east side of the Klickitat from the mouth to the confluence of the Klickitat and Little Klickitat Rivers and both sides of the Little

Klickitat, had Shoreline Development Quotients of 2.5 and 2.8 respectively.

Development in the City of Lyle was evenly distributed between shoreline areas and upland areas (Shoreline Development Quotient of 1.01). This distribution is probably due to the steep slope of the shoreline area, which makes development more difficult. Also, the hills above Lyle overlook the Columbia River Gorge, which makes the upland areas more appealing. Development in the City of Klickitat is mostly along the Klickitat River (Shoreline Development Quotient of 7.98) even though there were fewer total structures built in Klickitat than in Lyle. This trend is probably due to the accessibility of shoreline areas in Klickitat.

Key Findings

- While shoreline areas currently accommodate a relatively small percent of the development in Klickitat County, the percentage is increasing. Understanding how Klickitat County and the DOE issue permits for these developments will become increasingly important as shoreline development increases in Klickitat County.
- Shoreline development is a small percentage of development in Klickitat County – only 3.5% of structures built from 1972-1998 were built in shoreline areas. The data indicate that shoreline areas are developing at a rate faster than other areas.
- Analysis of shoreline impacts using the DOE permit database is limited because specific locations for permits are not available and there is no information on any vegetative clearing involved in development.
- The permitting process does not adequately address wetlands. Permit applicants are expected to identify whether wetlands exist on site. The County could make a determination of whether wetlands exist on sites using the National Wetland Inventory. However, for the purpose of permitting, the County only requires permit applicants to self-report wetlands on their land.
- The contents and organization of both paper and digital files make information relatively inaccessible. The database, for example, does not contain tax lot information about permits, which makes it difficult to link permits to parcels. Thus, the database structure does not facilitate tracking of conditions imposed on permits and associated enforcement actions.

Chapter 5

Development Impact Analysis

The Klickitat County Shoreline Master Program regulates development within the shoreline zone—generally identified as areas within 200 feet of selected waterways. A key component of this project is quantifying the amount of development that exists within the shoreline zone along the Klickitat and Little Klickitat Rivers. The chapter begins with a brief discussion of the research methods CPW used for the development impact analysis. The analysis itself is presented in five sections: Structures, Area of Impacts, Development Potential, Roads, and Wetlands.

Methods²²

CPW used aerial photo interpretation combined with geographic information systems (GIS) analysis to identify development within the shoreline zone. To describe development patterns and impacts along the Klickitat and Little Klickitat Rivers, CPW quantified:

- Structures within the 200-foot buffer zone;²³
- Roads within the 200-foot buffer zone;
- Wetlands within the 200-foot buffer zone; and
- Areas of potential future development.

To identify and locate shoreline development CPW used U.S. Geologic Survey (USGS) black and white aerial photos²⁴ from 1996 and Washington Department of Transportation (WSDOT) color aerial photos taken in 2002. The photos presented a few limitations in terms of the analysis presented in this chapter including:

- Obstructions, such as tree canopies, may obscure areas of development; these areas are not accounted for in our analysis; and

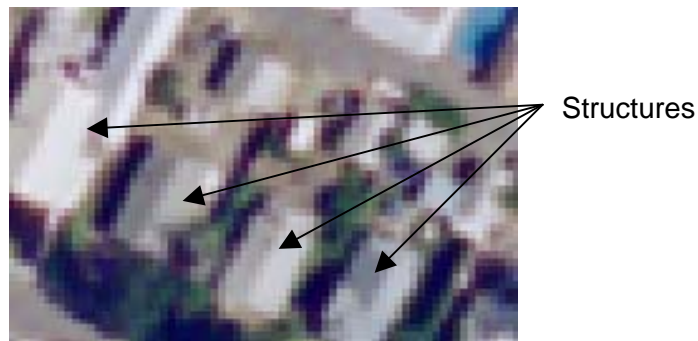
²² See Appendix A for a detailed discussion of research methods used for this project.

²³ CPW also analyzed development within 500 feet of the rivers to identify patterns of development.

²⁴ CPW utilized aerial photos that were geo-referenced (a.k.a., digital orthoquads or DOQs). DOQs are digital aerial photographs that have been spatially referenced so they can be displayed in GIS software and geographically aligned with other data coverages.

- The level of detail of the photos is not sufficient in some cases, to determine the specific type of structure or road type (i.e., residential vs. commercial).
- The 1996 aerial photos are black and white, which limits the level of detail in some photos; and
- The resolution of the 1996 and 2002 aerial photos is 3.28 feet; each pixel is 3.28ft x 3.28ft (1 meter), and 3ft x 3ft respectively. Therefore, the photos become pixilated when zoomed in for more detail (Figure 5-1).

Figure 5-1. Sample of resolution



Source: WSDOT aerial photograph, 2002.

CPW used GIS shape files from federal and state agencies, including the US Census, USFW National Wetlands Inventory, US Geologic Survey, the Washington Department of Transportation, Washington Department of Ecology, and the Department of Natural Resources. The Confederated Tribes of the Yakama Nation provided spatial data for the river reaches and the Klickitat County zoning layer.

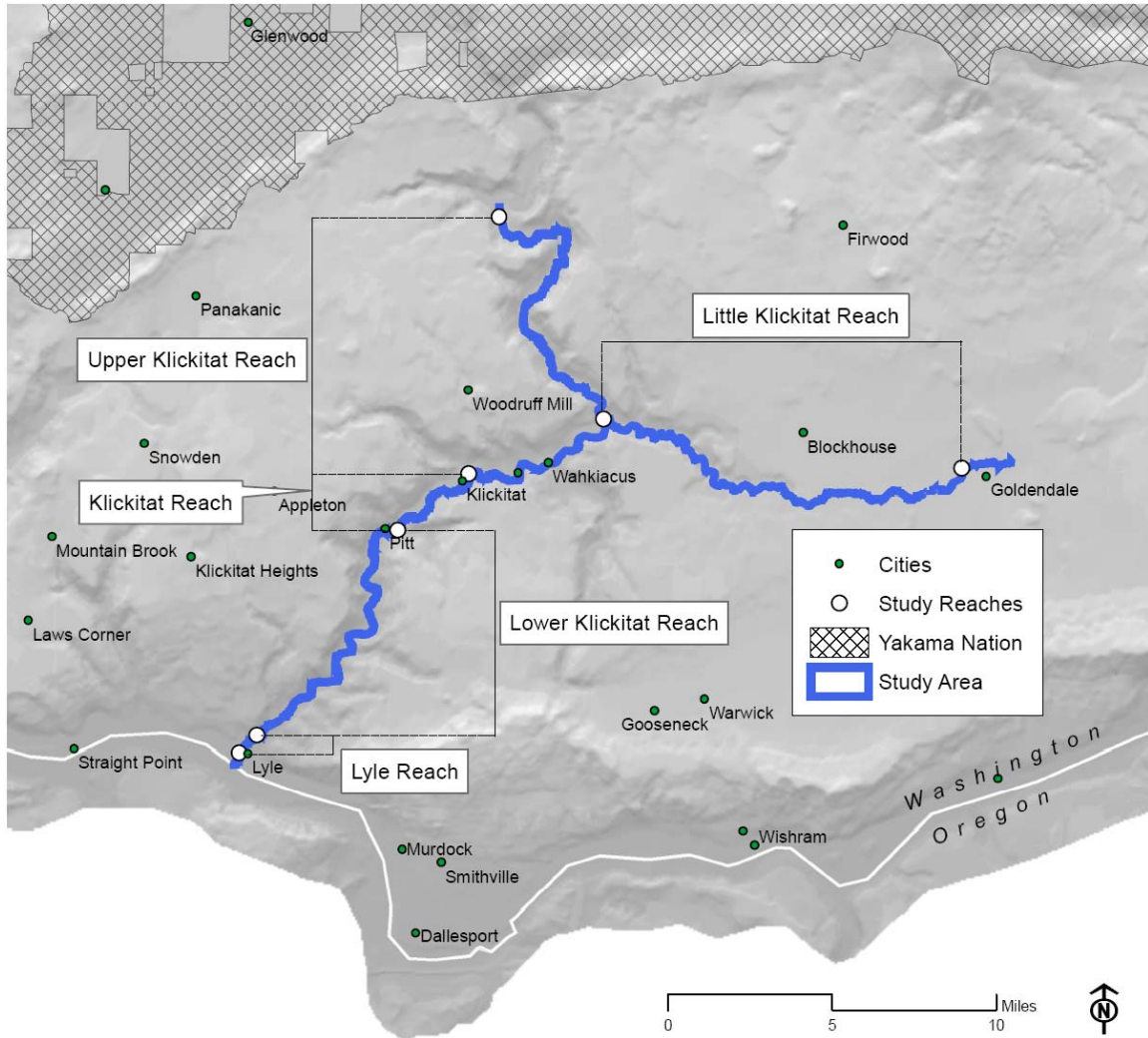
Reach Details

The shoreline study area includes land within 500 feet of the Little Klickitat and Klickitat Rivers – approximately 56 miles of riparian area (2,290 acres). CPW divided the Klickitat and Little Klickitat Rivers into five reaches for analysis purposes (Figure 5-2). The reaches are not based on political boundaries; rather they reflect the geologic, topographic, and ecologic conditions that uniquely characterize the riparian habitat of the study area. The five study reaches referred to in this study include:

- City of Lyle (45 acres/1.2 miles);
- Lower Klickitat River from Lyle to the City of Klickitat (496 acres/10 miles);
- City of Klickitat (167 acres/3.3 miles);
- Upper Klickitat River from the City of Klickitat to the northern boundary of the study area (835 acres/16.8 miles); and

- Little Klickitat River from the confluence with the Klickitat River to the western city limits of Goldendale (734 acres/15.5 miles).

Figure 5-2. Study reaches



Source: Confederated Tribes of the Yakama Nation, c. 2004; CPW, 2005.

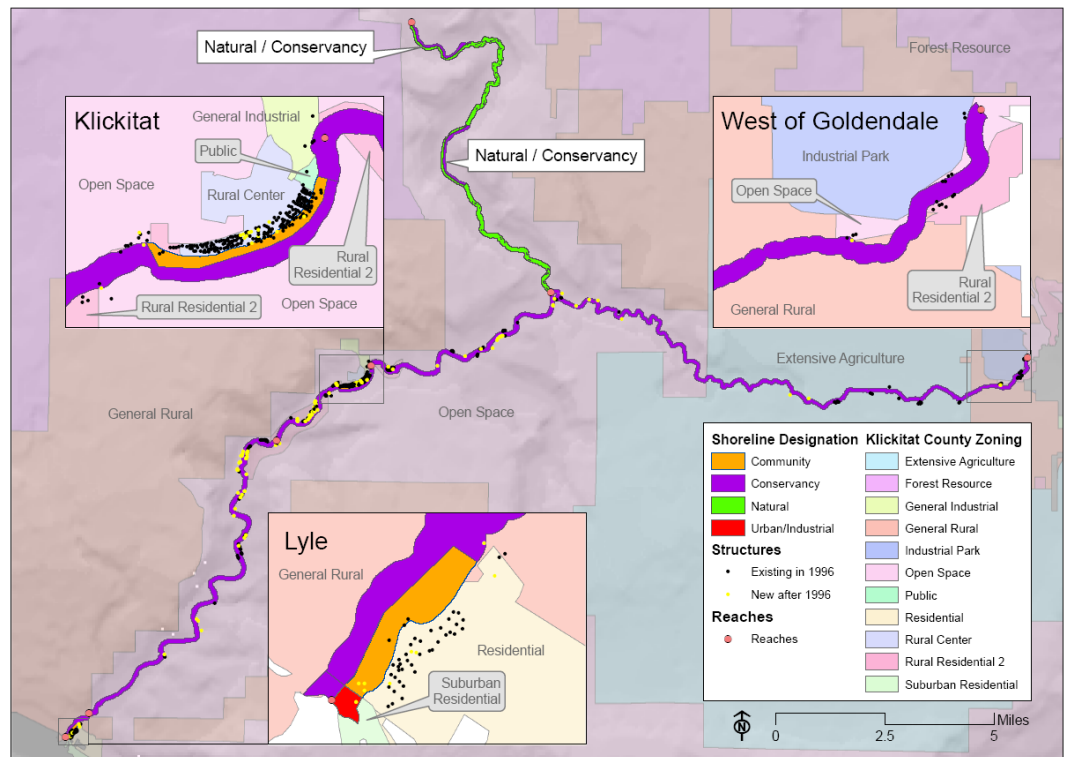
Structures

The structures analysis quantifies development patterns within the study area by locating and classifying structures by type of use (e.g., residential, agricultural, etc.). The following analysis compares the location and types of structures to County Zoning and Shoreline Master Program (SMP) zones.

Zoning Summary

The riparian areas along the Klickitat and Little Klickitat Rivers are regulated by two sets of county regulations: the County Zoning Ordinance and the SMP. Klickitat County enforces zoning designations for all land in the County. In addition to the County Zoning, the Klickitat SMP establishes shoreline environment designations that regulate development within 200 feet of Shorelines of Statewide Significance (Appendix E). Figure 5-3 shows County Zoning and SMP Shoreline Environment Designations within the study area.

Figure 5-3. County Zoning and SMP Shoreline Environment Designations



Source: Klickitat County Zoning GIS layers, 2003; Klickitat County SMP, 1996; CPW, 2005.

County Zoning

Within the study area, there are ten County Zoning types (Appendix E) ranging from areas zoned for agricultural to industrial use.

Table 5-1 summarizes the number of structures in 1996 and 2002 within the 200-foot buffer, by County Zoning Designation. CPW identified 91 structures within 200 feet of the rivers in 1996; this figure increased to 129 structures in 2002 (42% increase).

The majority of land within 200 feet of either the Klickitat River or the Little Klickitat River (70%) is designated as Open Space. Open space areas experienced a 59% increase in density of structures with 13 new buildings.

Rural Residential-2 zoning shows the next greatest increase with a 57% increase in structures per acre. Although the Residential zone shows a 150% increase in existing structures between 1996 and 2002, there was only an increase of three structures.

Table 5-1 shows that Rural Center has the most structures per acre, which is consistent with the County zoning. That is to say, more structures exist where zoning allows for higher density—a finding consistent with zoning regulations.

Table 5-1. Summary of County Zoning within the 200-foot SMP management area

County Zoning	Acres	Percent	Number of Structures		% Change in Structures per Acre, 1996 to 2002
			1996	2002	
Open Space	1,601	70%	22	35	59%
Extensive Agriculture	360	16%	3	3	0%
Rural Residential 2	203	9%	30	47	57%
General Rural	94	4%	0	1	
Rural Center	18	1%	32	35	9%
Residential	7	0%	2	5	150%
Industrial Park	2	0%	0	0	
General Industrial	2	0%	2	2	0%
Public	1	0%	0	0	
Suburban Residential	1	0%	0	1	
Total	2,289	100%	91	129	

Source: Klickitat County Zoning GIS layers, 2003; USGS DOQ photographs, 1996; WSDOT DOQ photographs, 2002; CPW, 2005.

SMP Shoreline Environment Designations

The County Zoning Ordinance and the SMP regulate where structures may be built, what types of structures are permitted, and how those structures are built. The residential element of the Klickitat County SMP addresses the distribution and location requirements of residential uses of shorelines and adjacent areas. The goal of the residential element of the SMP is to “Assure safe orderly residential growth in the shorelines of Klickitat County which will protect fragile and unique elements of the natural environment and which will protect the lives and property of the

residents of the shorelines.” This section summarizes zoning within the study area and describes the location of structures by zoning designation.

The Klickitat County SMP assigns Shorelines of Statewide Significant one of five Shoreline Environment Designations, including Natural, Conservancy, Rural, Community, and Urban/Industrial. The study area does not include land designated as Rural. The Shoreline Environment Designations are graduated in the sense that they become more restrictive as the environmental value of the shoreline area increases. For example, the Natural areas zone prohibits development, while the Urban/Industrial allows higher intensity urban development (Appendix C).

The majority of land (79%) within 200 feet of either the Klickitat or Little Klickitat Rivers is designated Conservancy (the second most restrictive designation). About 20% of the study area is designated as Natural, while a small portion (less than 2%) is designated as Community and Urban/Industrial. Although Community areas account for just 1% of the study area they contain 33% of the structures – a finding consistent with the goals of the SMP, which seeks to cluster and contain development impacts. No structures were built in Natural areas, which is consistent with the prohibition on development in Natural areas (Table 5-2 and Figure 5-3).

Table 5-2. Shoreline Environment Designation summary

Shoreline Designation	Acres	Percent	Number of Structures		
			1996	2002	%Change
Conservancy	1,806	79%	55	86	56%
Natural	449	20%	0	0	
Community	32	1%	36	42	17%
Urban/Industrial	1	0.1%	0	1	
Total	2,288	100%	91	129	

Source: Klickitat County SMP, 1996; USGS aerial photographs, 1996; WSDOT aerial photographs, 2002; CPW, 2005.

Zoning by Reach

County Zoning designations differ for each reach. In general, the Lower Klickitat and Upper Klickitat are more rural and have much more area designated as Open Space. In contrast, the City of Klickitat is primarily designated as Rural Residential-2, indicating the more developed nature of the reach. Most of Lyle is designated as General Rural, which may allow more development than Open Space. The Little Klickitat differs from the Klickitat and is split between Open Space and Extensive Agricultural zoning (Table 5-3).

Table 5- 3. County zoning areas by river reach

County Zoning	Lyle		Lower Klickitat		Klickitat		Upper Klickitat		Little Klickitat		Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Open Space	0	0%	445	89%	52	31%	791	94%	313	42%	1,601	70%
Extensive Agriculture	0	0%	0	0%	0	0%	0	0%	360	49%	360	16%
Rural Residential 2	0	0%	50.5	10%	94	56%	48	6%	10	1%	203	9%
General Rural	36	82%	3	1%	0	0%	0	0%	54	7%	94	4%
Rural Center	0	0%	0	0%	18	11%	0	0%	0	0%	18	1%
Residential	7	15%	0	0%	0	0%	0	0%	0	0%	7	0%
Industrial Park	0	0%	0	0%	0	0%	0	0%	2	0%	2	0%
General Industrial	0	0%	0	0%	1.5	1%	0	0%	0	0%	2	0%
Public	0	0%	0	0%	1	1%	0	0%	0	0%	1	0%
Suburban Residential	1	3%	0	0%	0	0%	0	0%	0	0%	1	0%
Total	44		498		167		840		739		2,289	

Source: Klickitat County Zoning GIS layers, 2003; USGS aerial photographs, 1996; WSDOT aerial photographs, 2002; CPW, 2005.

The Klickitat SMP Shoreline Environment Designations are consistent with County Zoning. The more urban areas of Lyle and Klickitat have higher percentages of the shoreline designated Community or Urban/Industrial. The Upper Klickitat reach is split between Conservancy and Natural, which provides increased protection of riparian habitat. The Lower Klickitat and the Little Klickitat reaches are designated entirely Conservancy (Table 5-4). The Shoreline Environment Designation on the Little Klickitat reach is more restrictive than the County Zoning. This makes sense because the SMP provides for buffers to prevent runoff from agricultural land, which comprises 49% of the land within 200 feet of the Little Klickitat River.

Table 5-4: Shoreline environment designation areas by reach

Shoreline Designation	Lyle		Lower Klickitat		Klickitat		Upper Klickitat		Little Klickitat		Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
Natural	0	0%	0	0%	0	0	449	53%	0	0%	32	1%
Conservancy	34	76%	498	100%	145	87%	391	47%	739	100%	1,806	79%
Community	10	21%	0	0%	22	13%	0	0%	0	0%	32	1%
Urban/Industrial	1	3%	0	0%	0	0%	0	0%	0	0%	1.4	0%
Total	45	100%	498	100%	167	100%	839.5	100%	739	100%	2,288	100%

Source: Klickitat County SMP, 1996; USGS aerial photographs, 1996; WSDOT aerial photographs, 2002; CPW, 2005.

Location of Structures

A key component of this study is the structures analysis. The structures analysis is intended to document the extent and location of development within shoreline areas.

CPW identified all existing structures within 500 feet of the Klickitat and Little Klickitat Rivers using 1996 and 2002 aerial photos. This analysis evaluates structures by buffer zone, reach, County Zoning, and Klickitat County SMP Shoreline Environment Designations.

The analysis further indicates whether a structure is located within the 0-50-foot buffer, 50-100-foot buffer, 100-200-foot buffer, or 200-500-foot buffer. CPW mainly focused the analysis within the 200-foot buffer to be consistent with the scope of the SMP shoreline regulations. Where possible, CPW also classified the types of structures including: (1) Residential; (2) Accessory structures (sheds, outbuildings, garages); (3) Commercial/industrial; and (4) Unknown.

Types of Structures

Table 5-5 summarizes structures within the 200-foot buffer in 1996 and 2002. The analysis shows an increase in residential structures, accessory structures, and commercial/industrial structures. According to CPW's analysis, a total increase of 38 structures occurred over six years within 200 feet of the river, increasing the number of structures by 42%. Residential structures are the most significant development type with 29 new structures in this six-year period. Accessory structures increased by 64% between 1996 and 2002.

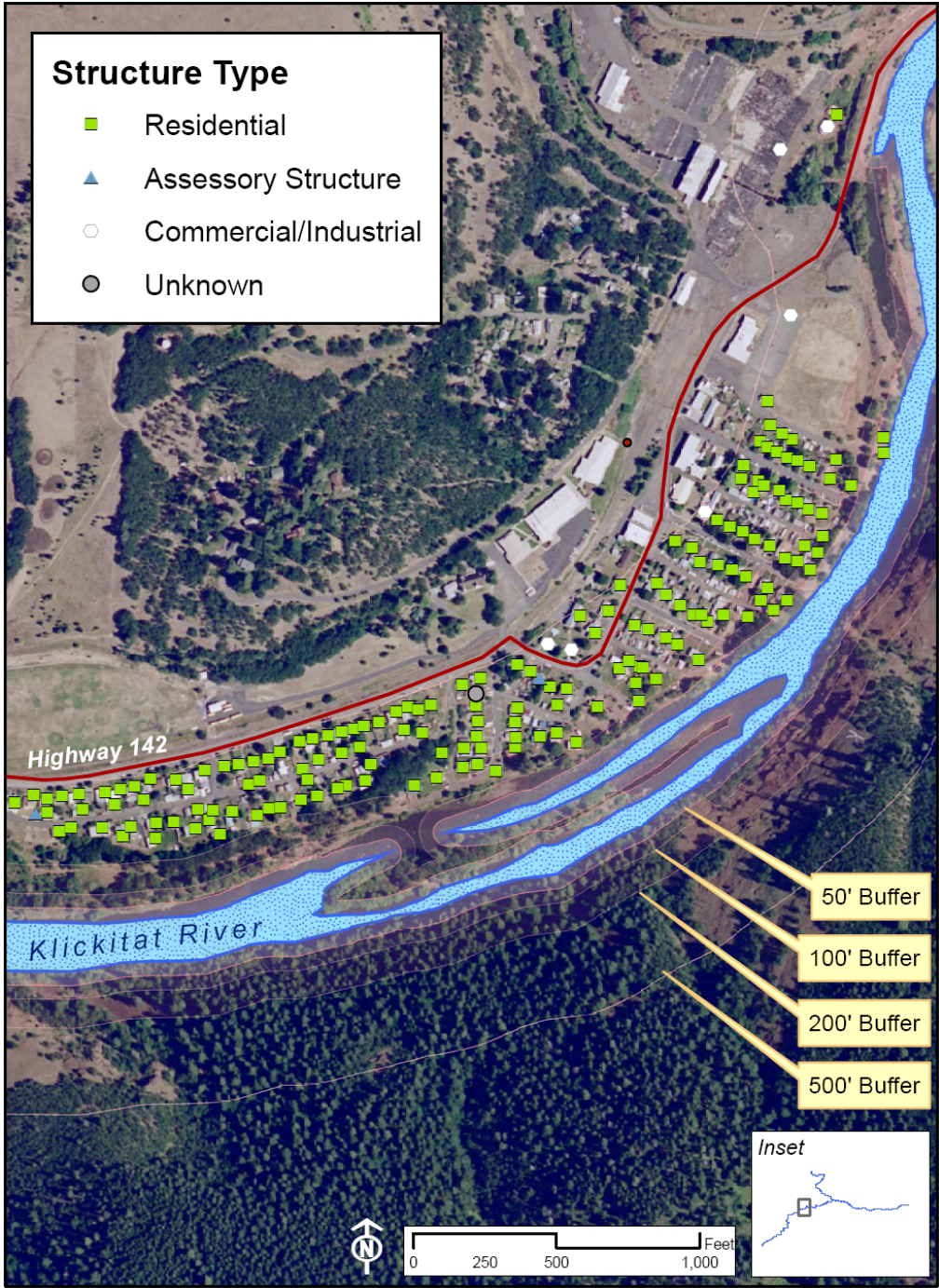
Table 5-5. Summary of existing structures within 200-foot buffer by type, 1996 and 2002

Type	1996	2002	# Increase	% Change
Residence	61	90	29	48%
Accessory structure	11	18	7	64%
Commercial/Industrial	8	11	3	38%
Unknown	11	10	-1	-9%
Total	91	129	38	42%

Source: USGS aerial photographs, 1996; WSDOT aerial photographs, 2002; CPW, 2005.

Residences comprise 70% of all types of existing structures within the 200-foot buffer, representing the majority of structures. The northern portion of the Klickitat reach contains the highest density of development of all study areas. Figure 5-4 shows a portion of the Klickitat reach, with structures and roads indicated by type and location within 500 feet of the Klickitat River.

Figure 5-4. Section of Klickitat reach



Source: U.S. Census, 2000; USGS aerial photographs, 1996; WSDOT aerial photographs, 2002; USFW National Wetlands Inventory, 1980-89.

CPW identified the location of structures in 1996 and 2002. Most of the identified structures are outside of the 200-foot buffer zone, which is consistent with the goal of the SMP – to limit non-water dependent development on shorelines. Overall, no structures exist within Natural Shoreline Environment Designation areas where development is prohibited by the SMP. The SMP also prohibits development within 50 feet of rivers. CPW identified seven structures within 50 feet of the rivers in the 2002 aerial photos. Analysis of the 1996 aerial photos suggests that five of these structures were built between 1996 and 2002.²⁵ CPW was unable to determine whether the two structures identified in 1996 were built before or after the SMP was enacted. In general, it appears that development is being permitted in areas consistent with the requirements of the shoreline environment designations.

Table 5-6 shows a summary of the change in structures per buffer zone and by structure type. In 2002, 25 structures existed within the 50- to 100-foot buffer zone. Limited development is permitted within this buffer. Development increased by 42% within the 200-foot buffer, between 1996 and 2002.

Table 5-6. Type of structures by buffer zone, 1996 and 2002

Structure Type	1996				2002				# Increase, 1996 to 2002				
	0-50'	50-100'	100-200'	Outside area	0-50'	50-100'	100-200'	Outside area	0-50'	50-100'	100-200'	Outside area	Total
Residence	2	13	46	195	6	21	63	230	4	8	17	35	64
Accessory structure	0	0	11	45	1	3	14	58	1	3	2	13	19
Commercial/Industrial	0	1	7	44	0	1	10	47	0	0	3	3	6
Unknown	0	2	9	13	0	0	10	22	0	-2	1	9	8
Total	2	16	73	297	7	25	97	357	5	9	24	60	97

Source: USGS aerial photographs, 1996; WSDOT aerial photographs, 2002; CPW, 2005.

Table 5-7 shows the number of structures in each reach and Shoreline Designation zone. CPW calculated the acres per reach, indicating the varying sizes of each reach. For example, the Lyle reach covers 45 acres, while the Upper Klickitat reach spans 835 acres. Table 5-7 shows the Klickitat reach includes 67 structures, with the majority existing within the Community Shoreline Designation zone. The Klickitat reach also has the highest density of structures in any study area, with 0.4 structures per acre. All of those structures are within the Community and Conservancy Shoreline Designation zones.

²⁵ CPW was also unable to identify whether these structures had an associated shoreline development permit.

The majority of all structures exist within the Conservancy Shoreline Designation zone, an area zoned for low levels of development. The Conservancy zone also had the greatest increase in new structures between 1996 and 2002. Each reach has relatively few structures per acre, with the Upper Klickitat reach having only 0.014 structures per acre. This signifies relatively low density throughout all reaches.

Table 5-7. Number of structures per reach and Shoreline Environment Designations, 1996 and 2002

Reach	Acres per reach	SMP Shoreline Designation Zones									
		Natural		Community		Conservancy		Urban/Industrial		Total	
		1996	2002	1996	2002	1996	2002	1996	2002	1996	2002
Lyle	835	0	0	2	5	0	1	0	1	2	7
Lower Klickitat	167	0	0	0	0	21	30	0	0	21	30
Klickitat	45	0	0	34	37	16	30	0	0	50	67
Upper Klickitat	734	0	0	0	0	8	12	0	0	8	12
Little Klickitat	496	0	0	0	0	10	13	0	0	10	13
Total	2,276	0	0	36	42	55	86	0	1	91	129

Source: USGS aerial photographs, 1996; WSDOT aerial photographs, 2002; CPW, 2005.

Area of Impacts

CPW developed a methodology to analyze the amount of area that has been developed in the shoreline areas of the Klickitat and Little Klickitat Rivers as well as the impact of these developed areas. Such development impacts fish and wildlife habitat throughout the Klickitat watershed.

CPW developed an indicator to provide a quantitative method of comparing the relative impacts of development in the study area. This *development impact index* links development impact to the area impacted, the number of structures in the area, and the distance from the river.²⁶ This indicator was used in conjunction with field observations to categorize each river reach and shoreline designation as high, medium, or low impact.

Extent of Development

Based on application of the development impact index, the average and total impact of development along the Klickitat and Little Klickitat Rivers increased from 1996 to 2002. This increase is most likely tied to the development of additional structures in the same areas that were already cleared. This would increase the impact of each area, but it also keeps the impact localized to areas that have already been impacted. Overall, development covers 227 acres (10%) of the shoreline (Table 5-8).

²⁶ Impact = (# of structures * acres) / (distance from the nearest river in feet)

Table 5-8. Summary of developed areas

Reach	Developed Area		
	Acres	Average	% Dev
Klickitat	35	3.14	21%
Little Klickitat	127	9.07	17%
Upper Klickitat	27	2.44	5%
Lower Klickitat	33	1.07	74%
Lyle	5	0.45	1%
Total	227	2.90	10%

Source: CPW analysis of 1996 USGS and 2002 WSDOT aerial photographs.

The developed areas along the Klickitat shoreline are mostly residential except for Lyle, which is split between open space, commercial, and road uses. However, the shoreline of the Little Klickitat reach is primarily agricultural. Both rivers also have some developed areas that are open space (Table 5-9).

Table 5-9. Developed area percentage in shoreline areas by type for each river reach

Reach	Residence	Agriculture	Commercial	Roads	Unknown	Culverts	Open Areas
Klickitat	21.4%	6.0%	0.0%	0.0%	0.0%	0.0%	0.8%
Little Klickitat	4.2%	19.6%	0.0%	0.0%	0.0%	0.1%	0.1%
Lower Klickitat	9.3%	2.1%	0.3%	0.0%	0.1%	0.0%	0.8%
Lyle	0.1%	0.0%	3.8%	2.2%	0.0%	0.0%	5.8%
Upper Klickitat	4.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total	39.6%	27.8%	4.1%	2.2%	0.1%	0.1%	7.4%

Source: CPW, 2005; USGS aerial photographs, 1996; WSDOT aerial photographs, 2002.

In addition to calculating the amount of shoreline developed, CPW used the development impact index, standardized by shoreline acreage, in conjunction with field observations to provide a qualitative analysis of the impacts of development in shoreline areas along the Klickitat and Little Klickitat Rivers. CPW categorized each reach and shoreline designation as high, medium, or low impact. The greatest impact is in the reach that includes the City of Klickitat. Most of this impact is along the west bank of the river where the shoreline is designated Community. Most of the remaining impact areas in the study area are in shoreline areas designated Conservancy (Table 5-10).

Table 5-10. Degree of development on shoreline areas by river reach and shoreline designation, 1996 and 2002**

Reach	Community		Conservancy		Urban/Industrial		Overall
	1996	2002	1996	2002	1996	2002	
Klickitat	High	High	Medium	Medium	*	*	High
Little Klickitat	*	*	Medium	Medium	*	*	Medium
Upper Klickitat	*	*	Low	Low	*	*	Low
Lower Klickitat	*	*	Low	Low	*	*	Low
Lyle	Low	Medium	*	Low	*	Low	Medium
Overall	High	High	Medium	Medium	Low	Low	

* No structures were present in these areas; therefore, no impact could be assigned.

** No structures were present in areas designated as Natural.

Source: CPW, 2005; USGS aerial photographs, 1996; WSDOT aerial photographs, 2002.

These findings are consistent with the Shoreline Environment Designations laid out in the SMP. No development was found in Natural areas, which prohibits most types of development. Areas with a Community designation allow the greatest residential development and exhibit the highest intensity of development. Urban/Industrial areas allow for higher intensity development, but the study area includes such a small area of this designation that it has a low impact.

Key Findings

- Only 10% of the shoreline area in the study area has been developed.
- Despite the small amount of development throughout the study area, the average impact of this development increased from 1996 to 2002.
- The Klickitat reach has the highest density of development and thus a high impact. This is consistent with the Community shoreline designation that covers most of the reach.
- This reach is also relatively small and therefore has the greatest impact per river mile.
- The low impact and developed percentage in Lyle is not consistent with the shoreline designations of community and industrial/commercial. This is probably because the banks of the river are steep, thus developing the shoreline areas is very difficult.
- Despite the large percentage of the Lower Klickitat reach that has been developed, this reach has a low-average impact of development. This indicates that development has occurred on lots that are smaller and farther from the river than in the reaches with higher impacts.

Development Potential

One way to estimate future impacts is to evaluate development potential along the Klickitat and Little Klickitat Rivers. CPW devised a classification system for stretches along the rivers that includes: low, medium, and high levels for potential development.²⁷ The criteria employed to assess development potential on shorelines include: topography, County Zoning, SMP Shoreline Environment Designation, transportation access, and density of adjacent development (Table 5-11).

Table 5-11. Development potential criteria

	Low	Medium	High
Topography	Steep, rocky terrain: no development	Moderately steep: Clearing and Grading	Fairly flat: Clearing
Zoning*	County: Open Space; Extensive Agriculture SED: Natural	County: Rural Residential (1 and 2) SED: Conservancy	County: Rural Center; General Rural; Suburban Residential; Residential; Industrial SED: Community; Urban/Industrial
Access	No roads	Rural roads: gravel/paved	Community roads; highways
Density	Highly developed	Low density, with high level of open space	Land that is adjacent to high development, with open space and utilities

*County = County Zoning; SED = SMP Shoreline Environment Designation

Source: Klickitat County SMP, 1996; Klickitat County Zoning GIS layer, 2003; CPW, 2005.

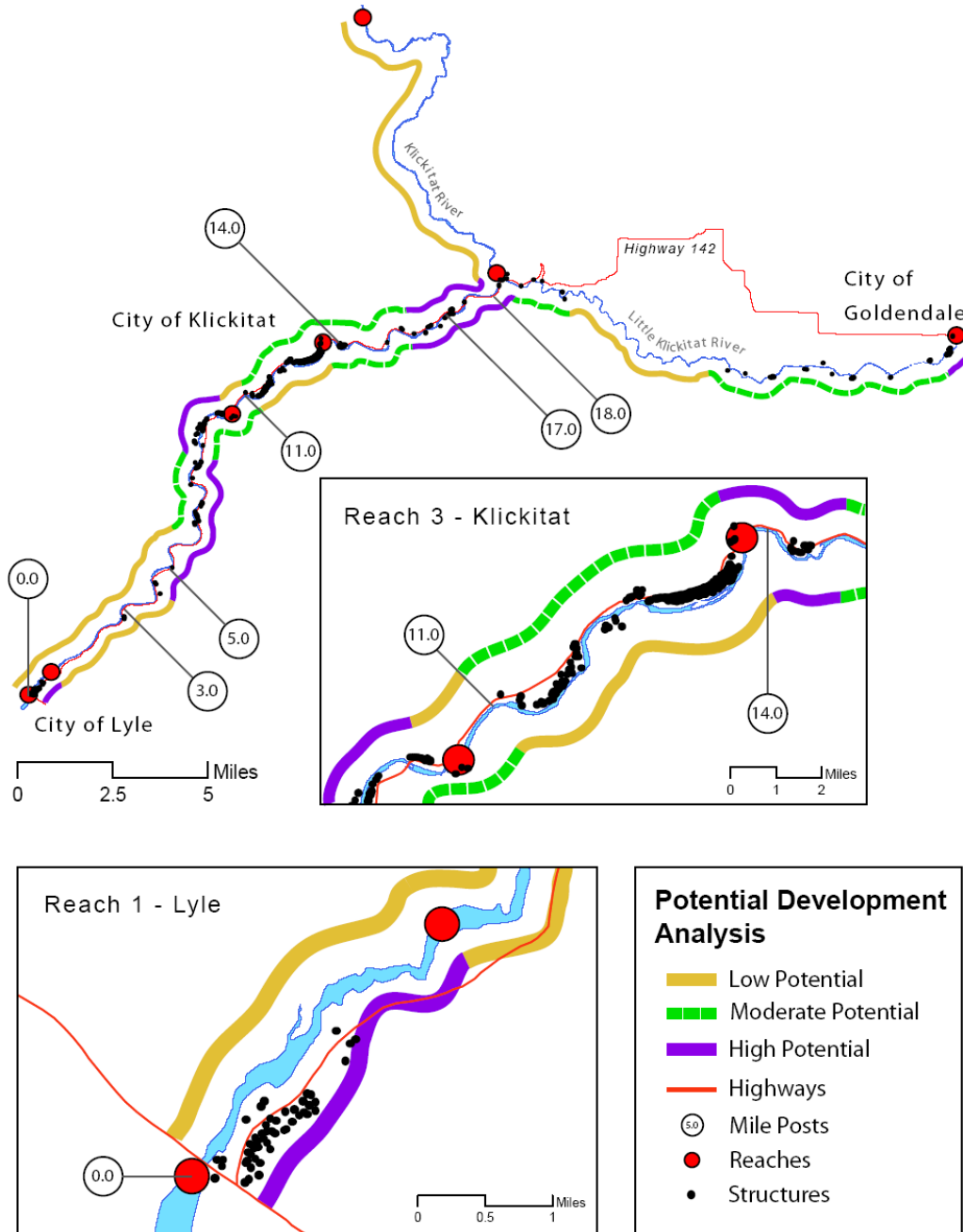
CPW analyzed areas of potential development by driving the length of the Klickitat River, determining, based on the criteria in Table 5-11, different levels of potential development. Seeing the shoreline area first-hand provided a more accurate picture of actual potential for development.

CPW created a map of the rivers to demonstrate the spatial distribution of areas with low, medium, and high potential for future development (Figure 5-5). In this preliminary analysis, we conclude that the areas around the City of Klickitat and the City of Lyle have the highest potential for development, with a significant

²⁷ A more accurate estimate of development potential is possible using a GIS tax lot layer and zoning. These two data sources would allow a tax lot specific evaluation of development potential.

section of the Klickitat and Little Klickitat Rivers having a medium level of potential development.

Figure 5-5. Areas of potential development



Source: WSDOT aerial photographs, 2002; CPW, 2005.

The Washington Office of Financial Management (OFM) forecasts that Klickitat County will grow from 20,338 to 25,855 between 2005 and 2025— or about 5,517 persons.²⁸ This equates to more than 2,000 new dwelling units during this period. CPW did not attempt to predict where these future residents would locate—but many will be attracted to areas with high natural amenity—including shoreline areas. Klickitat County has significant land available for future growth.

Analyzing where growth occurred historically is one method to evaluate where future growth might occur. In shoreline areas, most development (40% in 2002) exists in Rural Center zoned areas (i.e., the Cities of Lyle and Klickitat). In terms of the area with the greatest increase in development, Open Space zoned land has been most affected (59% increase in structures between 1996 and 2002). However, the actual number of structures in Open Space (1,601 acres) only increased from 22 to 35 structures between 1996 and 2002. Our analysis of aerial photos identified 38 new structures within the 200-foot buffer between 1996 and 2002.

If development in the shoreline area continues at this historical rate, one would expect about 125 new structures to be located in the shoreline area between 2005 and 2025. According to CPW's analysis, it does not appear land availability will present any significant constraints to future growth in the County. CPW concludes that there is a significant amount of potentially developable land throughout the County.

Key Findings

The major findings from this analysis include:

- Within the analysis area (500 feet from the river), 388 structures existed in 1996 and 486 structures in 2002, an increase of 98 structures (20%) in six years;
- Within the 200-foot buffer, development increased from 91 structures in 1996 to 129 structures in 2002 (42% increase);
- Residential structures are the predominant structure type within the study area, with 90 residences in 2002, a 48% increase from 1996;
- Seven structures are located within the 50-foot buffer. According to Klickitat County regulations, development is prohibited within the 50-foot buffer zone²⁹;

²⁸ Klickitat County Population Forecast, <http://www.ofm.wa.gov/pop/gma/gmintermediate.pdf>, (accessed April 1, 2005).

²⁹ Due to the limitations of the data we are unable to determine if these structures were built before or after the SMP was enacted (1972), or whether the County issued a permit for this development.

- Klickitat Reach contains the most structures, with 67 in 2002;
- Residential growth was greatest at the eastern end of the Little Klickitat River, near Goldendale, with 30-40 housing structures built per square mile between 1990-2000³⁰;
- The greatest growth per acre (59%) along the Klickitat and Little Klickitat Rivers occurred in areas zoned for Open Space by the County; and
- Most development (67% in 2002) in the SMP Shoreline Environment Designation areas is within Conservancy designated areas.

Roads

At the most basic level, a road network facilitates the transport of goods and people and provides access. Analyzing the existing road network along the Klickitat and Little Klickitat Rivers provides insight into the accessibility and intensity of use of certain areas. Different types of roads (i.e., paved, gravel, and dirt) and their associated uses (i.e., travel or recreation) can significantly impact the surrounding environment through an increase in impervious surface, soil compaction, and the removal of vegetation.

The purpose of the road analysis is three-fold:

1. To identify the road network within the 200-foot buffer along the Klickitat and Little Klickitat Rivers;
2. To identify the road type—highway, paved, or gravel/dirt—of existing roads and calculate the length of roads within the 50-foot, 100-foot, and 200-foot buffer; and
3. To gauge the area of impact of the road network.

The findings are broken down into two sections: total road length and total area of road impact. These calculations were made for the five reaches along the Klickitat and Little Klickitat Rivers within the 50-, 100-, and 200-foot buffer.

Total Road Length³¹

CPW inventoried a total of 36 miles of road within the 200-foot buffer of the study area. Gravel/dirt roads and highways are the predominant road type, making up about 75% of the total miles of road in the buffer. The Lower and Upper Klickitat reaches have a

³⁰ U.S. Census Bureau, 2000, <http://www.census.gov/> (accessed April 1, 2005).

³¹ Appendix I presents detailed road analysis tables for this section.

total of 30 miles of road length within the 200-foot buffer—over 80% of the total length of road within the 200-foot buffer (Appendix I).

Roads in 50-foot Buffer

CPW identified a total of 10 miles of road in the 50-foot buffer of the study area. The predominant road type in the 50-foot buffer is highway, totaling 3.8 miles. The Lower Klickitat reach has nearly 3 miles of highway within the 50-foot buffer. The Upper Klickitat reach has nearly 3 miles of paved road within the 50-foot buffer.

Roads in 50-100-foot Buffer

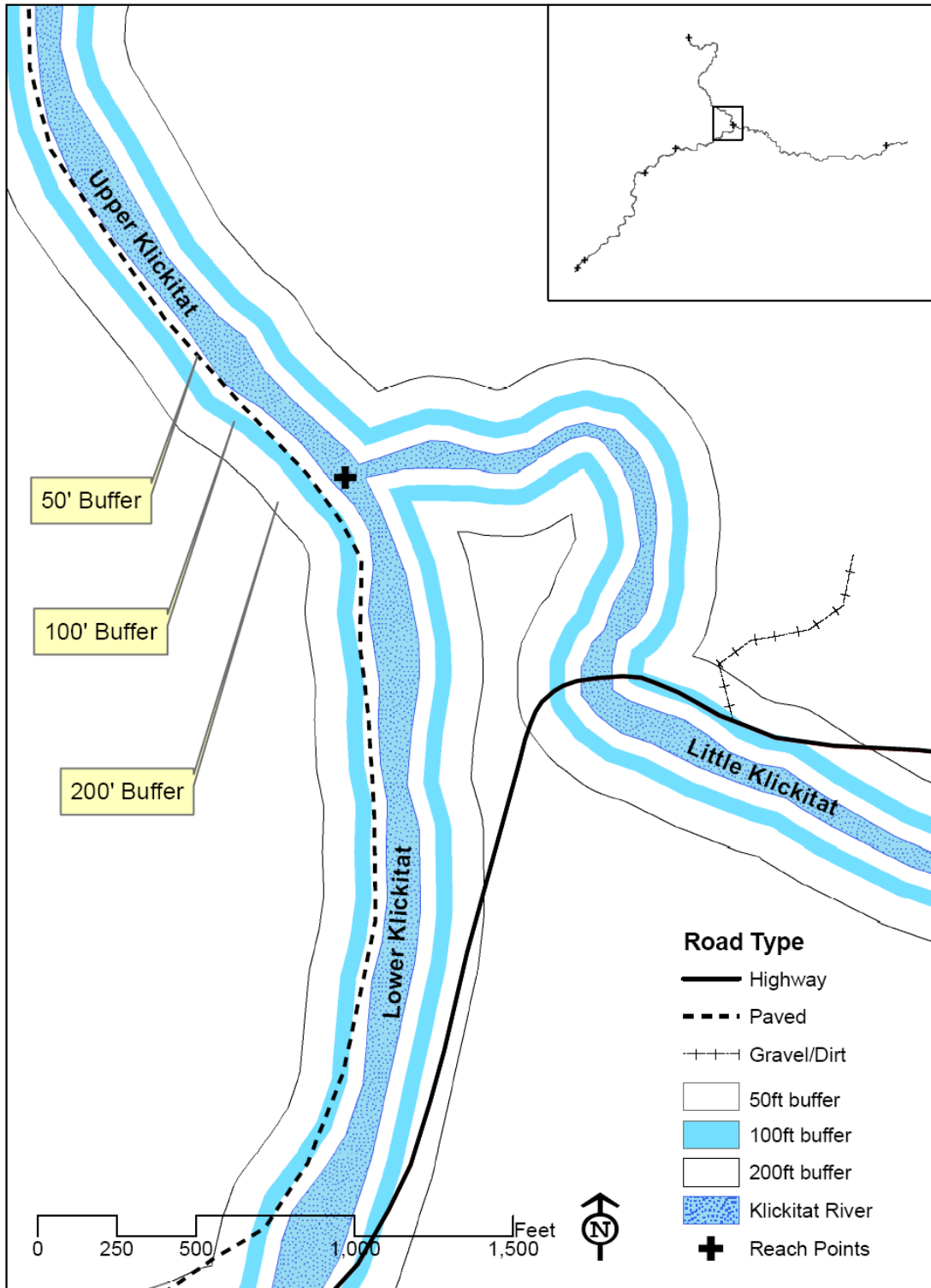
CPW identified 11.6 miles of road within the 50-100-foot buffer of the study area. The predominant road type in this buffer is gravel/dirt, totaling 4.6 miles primarily within the Lower Klickitat reach. There are over 2 miles of highway within the 50-100-foot buffer in the Lower Klickitat reach. The Upper Klickitat reach has nearly 3 miles of paved road within the 50-100-foot buffer.

Roads in 100-200-foot Buffer

CPW inventoried 14.3 miles of road within the 100-200-foot buffer of the Klickitat and Little Klickitat Rivers. The Upper Klickitat reach has 6.4 miles of road within the 100-200-foot buffer. The predominant road type in the buffer is gravel/dirt, totaling seven miles.

Figure 5-6 shows a sample section of the roads analysis. The map shows road types at the confluence of the Klickitat and Little Klickitat Rivers relative to buffer location.

Figure 5-6. Roads at the confluence of the Klickitat and Little Klickitat Rivers



Source: USGS aerial photographs, 1996; WSDOT aerial photographs 2002, and CPW, 2005.

Impact Area of Roads

Using the estimated road widths per road type, CPW calculated the total impact area in acres. There is a total of 169 acres of land impacted by the road network within the 200-foot buffer of the study area. The Lower Klickitat and Upper Klickitat reaches account for the majority of impacted areas, with highway as the predominant road type. In total, the highway within the 200-foot buffer has the largest impact area of 80 acres.

Key Findings

The major findings from the road analysis include:

- The Lower and Upper Klickitat River reaches are the most developed in terms of roads within the 200-foot buffer;
- Gravel/dirt is the predominant road type within the 200-foot buffer, totaling 15 miles; highway accounts for 13 miles of road within the 200-foot buffer; and
- Highway has the greatest area of impact within the 200-foot buffer, totaling 80 acres in the five reaches.

Development and Identified Wetlands

Wetland delineation is one method of classifying characteristic riparian vegetation and hydrology zones. Wetlands provide habitat for plants and animals, and are a source of freshwater and groundwater pollutant remediation. Thus, an analysis of development within identified wetlands along the Klickitat and Little Klickitat Rivers is useful in understanding the impact of human activity on riparian vegetation. This section summarizes the extent of wetlands and development on or near wetlands within the Shoreline Management Zone. It also discusses the various environmental acts and regulations associated with wetlands.

The USFW National Wetlands Inventory (NWI) created the geospatial data for this analysis, in 1980-1989.³² There are five types of wetlands along the Klickitat and Little Klickitat Rivers (Appendix J):

- Freshwater Emergent
- Freshwater Forested Shrub Wetland
- Riverine
- Lake
- Other

³² USFW National Wetlands Mapper, http://www.wetlands.fws.gov/mapper_tool.htm, (accessed April 1, 2005).

Wetland Density by Reach

Table 5-12 summarizes wetlands by river reach. The Lower Klickitat, Klickitat, and Upper Klickitat reaches have significantly higher wetland densities than the Lyle and Little Klickitat reaches. The topography of these two reaches is less conducive to wetland formation than the Lower Klickitat, Klickitat and Upper Klickitat reaches (Table 5-12).

Table 5-12. Acres of wetland within 200-foot buffer*

Reach	Acres within		Percent
	200-foot buffer	Acres of wetland	
Lyle	62	0.5	1%
Lower Klickitat	667	338	51%
Klickitat	221	99	45%
Upper Klickitat	1,085	978	90%
Little Klickitat	808	41	5%
Total Acres	2,844	1,455	51%

*Note: "Acres within 200-foot buffer" includes acres of buffer and river.

Source: USFW National Wetlands Inventory, 1980-1989; CPW, 2005.

Types of Wetlands

Wetlands are classified by type to indicate common characteristics of riparian areas. The vast majority of wetlands along the Klickitat and Little Klickitat Rivers are Freshwater Forested Shrub Wetlands (33%) and Riverine Wetlands (66%) (Table 5-13). The Lower and Upper Klickitat reaches contain a significant percentage (90%) of all wetlands in the study area, which is likely a result of the combination of the length and topography of these reaches.

Table 5-13. Summary of wetlands (in acres) along the Klickitat and Little Klickitat Rivers

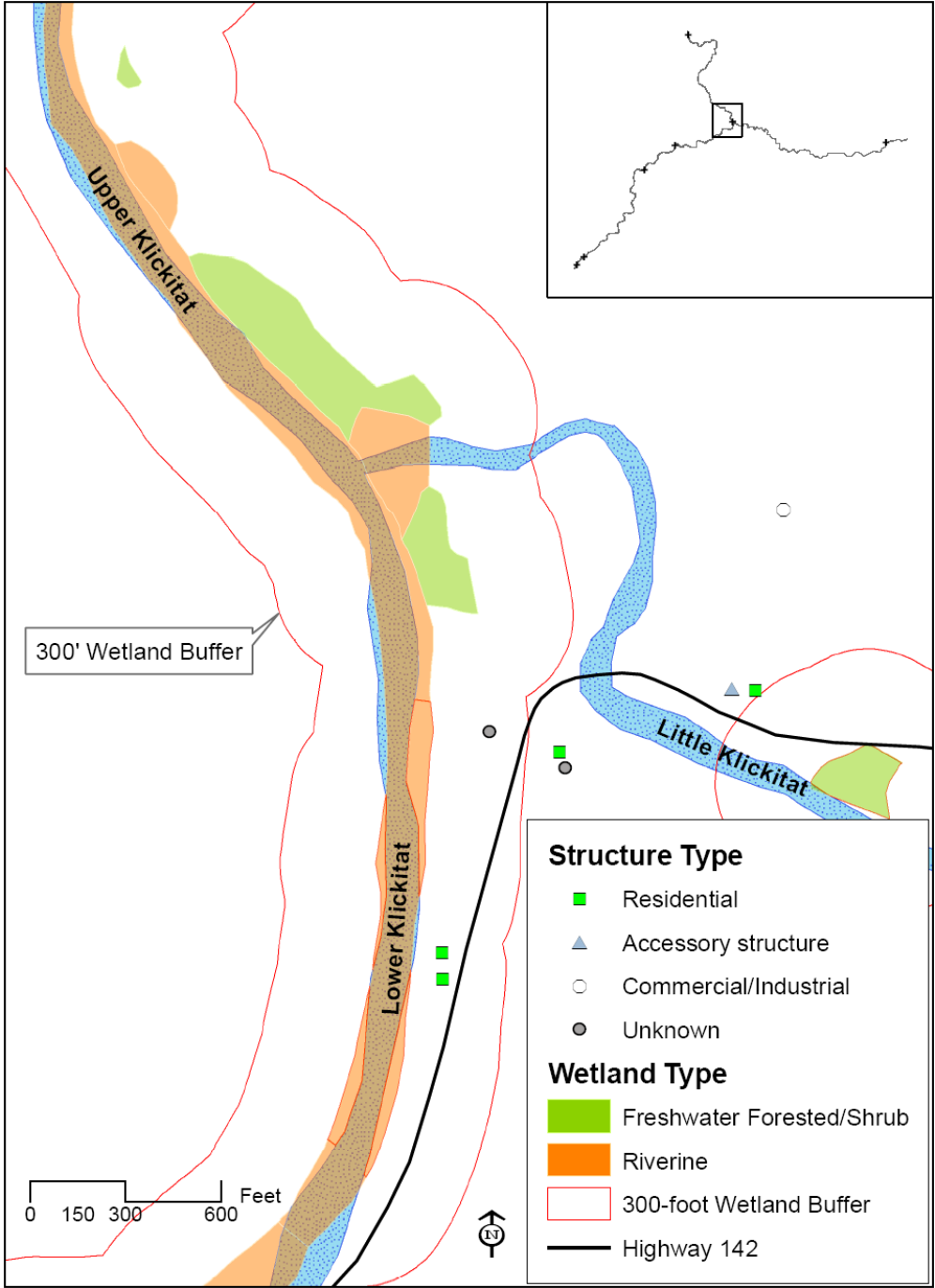
Reach	Freshwater Forested Shrub Wetland					Total Acres	Percent
	Freshwater Emergent	Riverine	Lake	Other			
Lyle	0.3	0	0	0.2	0	0.5	<1%
Lower Klickitat	2	52	280	2	1.5	338	23%
Klickitat	0	29	67	0	3	99	7%
Upper Klickitat	1	370	607	0	0	978	67%
Little Klickitat	12	28	0	0	0	41	3%
Total	16	479	954	2	4	1455	100%
Percent	1%	33%	66%	0%	0%	100%	

Source: USFW National Wetlands Inventory, 1980-1989; CPW, 2005.

Structures Near Wetlands

We limited our scope of wetlands to those within 200 feet of the Klickitat and Little Klickitat Rivers. To better understand the extent of development relative to wetlands the following analysis includes a summary of structures 500 feet from waterways that are also less than 300 feet from wetlands (Figure 5-7). The SMP addresses development within 200 feet of waterways. However, we included these structures because they likely impact wetlands found within the 200-foot buffers.

Figure 5-7. Example of structures within 300-foot wetland buffers



Source: USFW National Wetlands Inventory, 1980-1989; CPW, 2005.

County regulations require a 300-foot buffer between development and wetlands over 2,500 square feet.³³ All 385 individual wetlands in the study area are larger than 2,500 square feet. Wetlands in the study area average 3.78 acres (164,688 sq. ft.).

Our analysis found seven structures on wetlands designated by the USFW NWI:

- Six structures are sited on wetlands along the Klickitat reach near Klickitat, Washington.
- One structure is located on a wetland in the Upper Klickitat reach.

Of the 494 structures within 500-feet of the rivers, 355 are less than 300 feet from designated wetlands (Table 5-14). CPW could not determine how many of these structures were built after the Shoreline Management Act was enacted in 1972.

Table 5-14. Number of structures built within 300 feet of designated wetlands

Reach	Structures within 500 feet of rivers	Structures within 300 feet of wetlands	
		Structures within 300 feet of wetlands	Percent
Lyle	51	0	0%
Lower Klickitat	86	74	86%
Klickitat	271	205	76%
Upper Klickitat	39	33	85%
Little Klickitat	47	43	91%
Total	494	355	72%

Source: USFW National Wetlands Inventory, 1980-1989; CPW, 2005.

Key Findings

The major findings from this analysis include:

- 72% of structures (355) are located within 300 feet of wetlands;
- Seven structures are situated on wetlands;
- Riverine Wetlands are the predominant (66%) of all wetland types within the study area. Freshwater Forested Shrub Wetlands account for the second most common type (33%);

³³ Klickitat County Critical Areas Ordinance (Section 3.2), <http://www.klickitatcounty.org/Planning/FilesHtml/ZoningPDF/03-General-SupplementaryProvisions.pdf> (accessed March 10, 2005).

- The Lower and Upper Klickitat reaches have significantly more wetlands per acre than Lyle, Klickitat, and the Little Klickitat reaches;
- Although the Klickitat reach is the second shortest reach in this analysis, it is the most densely populated and contains a high proportion of wetlands; and
- For the most part, the Little Klickitat is bound by increasingly steeper terrain as it progresses from Goldendale to the Klickitat River confluence. More wetlands exist in the eastern portion of this Reach, which includes agricultural land-use and rolling pastureland.

Conclusion

While current levels of development are relatively low within Klickitat County, future growth may impact the shorelines of the Klickitat and Little Klickitat Rivers. By understanding current conditions along the rivers, including number of existing structures, roads, wetlands; and County zoning, we can analyze future potential development.

- The greatest growth along the Klickitat and Little Klickitat Rivers was in areas zoned Rural Residential 2 (17 structures) and Open Space (13 structures) by the County.
- Most development occurred in areas designated Conservancy (86 structures) and Community (42 structures).
- Within the analysis area (500-foot buffer zone), 388 individual structures existed in 1996 and 486 structures in 2002, an increase of 98 structures (20%) in six years.
- Residential structures are the predominant structure type within the study area, with 90 residences in 2002, a 20% increase from 1996.
- Gravel/dirt is the predominant road type within the 200-foot buffer, totaling 15 miles; highways account for 13 miles of road within the 200-foot buffer.
- The Lower and Upper Klickitat River reaches are the most developed in terms of roads within 200 feet of the Ordinary High Water Mark.
- 355 structures (72%) identified in the development impact analysis are located within 300 feet of wetlands.
- Seven structures are situated on wetlands.

Chapter 6

Recommendations

CPW's analysis of Klickitat County's Shoreline Master Program (SMP) provides the Confederated Tribes of the Yakama Nation with baseline information on the intensity, rate, type, and potential impact of development along the Klickitat and Little Klickitat Rivers. Based on the findings and conclusions of the SMP analysis, CPW developed recommendations that address the following issues:

- Steps the Yakama Nation may take to become a more effective partner in the evaluation and monitoring of development in shoreline areas of interest;
- Improvement of spatial data for future evaluation efforts;
- Revision, implementation, monitoring, funding, and outreach efforts of the SMP; and
- Permit database management of the Department of Ecology (DOE).

Confederated Tribes of the Yakama Nation

As co-manager of the Columbia, Wind, White Salmon, Klickitat, Yakima, Wenatchee, Methow, Entiat and Okanogan rivers, the Yakama Nation has a vested interest in the impact of development on Trust resources and activities affirmed through treaties with the federal government. CPW recommendations recognize the Tribe's sovereign right to monitor development in areas of interest and to pursue future evaluation efforts to ensure trust and treaty resources are protected. CPW recommendations for the Tribe include:

- *Monitor development permits in areas of interest.* The Tribes can work with the DOE or the County to monitor development permits throughout the County. The Tribes may establish a memorandum of agreement (MOA) with the County or the DOE to provide a record of development permits in areas of interest.
- *Exercise right as a third party to receive notice of all permits and public notices through the County's mailing list.* The Tribes may request to be added to the County's mailing list to keep apprised of development and public notices throughout the County.

- *Educate tribal staff on basic SMP development regulations as a means to enhance awareness of illegal development activity.* The Tribes may provide a workshop on SMP development regulations as a means to educate tribal staff about legal/illegal development. Enhanced awareness among tribal staff may increase the reporting of illegal development activity.
- *Acquire needed data for future evaluation efforts.* Although CPW conducted a detailed analysis of the Klickitat County SMP, the process generated several ideas that may enhance future evaluation efforts. The Tribes should consider acquiring the following data to improve future analyses:
 - *Tax-lot spatial data.* County tax-lot spatial data may improve spatial referencing and provide additional data fields that can be used for analytical purposes.
 - *Global Positioning System (GPS)-mapped development patterns.* Using GPS to locate and map development may improve the accuracy of future analyses of development patterns.
 - *Detailed inventory of structures that identifies small-scale development (e.g., garages, docks, sheds).* Identification of small-scale development may provide a more accurate picture of development throughout the County.
 - *GIS spatial data including land cover and vegetation type; impervious groundcover; and updated wetlands delineation.* This spatial data may improve environmental impact analyses, enhancing shoreline protection efforts.
- *Partner with land-conservation organizations (LCOs) to acquire land of Tribal interest.* LCOs can play a unique role in shoreline preservation and protection through an incentive-based approach to land acquisition that may be attractive to property owners. The Tribes may consider working with LCOs such as the Trust for Public Land that specialize in Tribal land acquisition.

Department of Ecology

The Department of Ecology (DOE) plays an integral role in the regulation of shoreline development throughout Klickitat County. The DOE provides technical assistance to local governments in the preparation and revision of SMPs and acts as a regulatory authority in the permitting process. To enhance the oversight role of the DOE, CPW recommends improving the management of the permit

database and acquiring relevant spatial shoreline data. CPW recommendations include:

- ♦ *Require more detailed information for all County shoreline permits to enhance the utility of the permit database.* As the County enhances its shoreline-permitting processes, the DOE should, in turn, receive more detailed information for its permit database. Nonetheless, the DOE should require tax-lot information, permit purpose, and conditions imposed for each permit in the database.
- ♦ *Acquire County spatial shoreline data to expand existing database and improve spatial evaluation ability.* The DOE should acquire the Geographic Information Systems (GIS) data layers for the designated shoreline environments and tax lots to expand its database and enhance its ability to perform detailed spatial analysis.
- ♦ *Publish biannual reports that include the number and type of shoreline permits issued, wetland mitigation actions taken, and all development within shoreline zones.* Shoreline development throughout the County is not adequately tracked. The County does not have a process that summarizes shoreline development; biannual reports would help facilitate evaluation processes. The reports should identify the number of permits issued by type, the location of permits issued, and other data determined relevant to the monitoring effort.
- ♦ *Maintain files of management and mitigation plans required by the CAO and SMP.* The SMP and the CAO both require landowners to have mitigation or management plans as a means to protect or preserve environmentally sensitive areas on the subject property. The County should maintain files of such plans for reference and future evaluation purposes.

Klickitat County's Shoreline Master Program

Klickitat County uses its governmental authority to regulate development throughout the County. Inherent to this authority is the responsibility to update management plans to adhere to state guidelines, to monitor the effectiveness of existing policies and regulations, and to maintain a fair and efficient permitting process. Based on CPW's analysis of the SMP, Klickitat County has earnestly implemented the regulations set forth in the SMP.

Based on our analysis, CPW makes the following general recommendations:

- The SMP should be revised to better integrate with the Critical Areas Ordinance (CAO) adopted in 2004.

- The County should enhance its role in the monitoring and enforcement of the SMP.
- Due to limited funding, the County should leverage existing funds through forming partnerships and pursuing grant opportunities.
- The County should expand its public outreach efforts to better educate citizens about shoreline development regulations.

Revision of the Shoreline Master Program

Klickitat County updated the SMP in 1996. According to recent Shoreline Management Act (SMA) amendments, the County is not required to update its SMP until 2014. However, the DOE encourages counties to voluntarily amend or revise their SMPs prior to the mandated deadlines to better comply with SMA guidelines and to meet changing community needs. CPW recommendations for the revision of Klickitat County's SMP include:

- ♦ *Revise the SMP to acknowledge the policies and regulations set forth in the CAO.* The SMP is required to provide a level of protection at least equal to the CAO for critical areas. Similarly, the County's Floodplain Ordinance (FPO) should be revised to recognize the applicable regulations set forth in the SMP and the CAO.
- ♦ *Revise the SMP to ensure consistency with new DOE guidelines.*³⁴ The DOE has adopted several SMA amendments since the adoption of the County's 1996 SMP that affect the meaning of terms and concepts and the interaction of SMPs with other regulatory documents.
- ♦ *Apply for State-update grants that are earmarked for SMP updates.* The DOE provides grants for all cities and counties updating their SMPs. The State recommends counties apply for SMP-update grants at least two years prior to mandated deadlines.

³⁴ Counties and cities throughout the state are required to update their SMPs (by their mandated deadline) per the revised 2003 Guidelines (WAC 173-26). The new guidelines set forth "governing principles" for interpreting how regulations are to be applied. The principles include: 1) Resource protection is required for new shoreline uses and development—establishing "no net loss of shoreline ecological functions" as an environmental protection standard; 2) Resource restoration needs of the shoreline are addressed through local comprehensive planning, while not imposing unfair burdens of restoration on private development; and 3) Clear direction to review and update local laws is provided in a manner consistent with constitutional protections on property ownership and use. New guidelines also address the integration of shoreline programs with other local comprehensive plans and development regulations; the protection of shoreline vegetation through clearing and grading standards or setback and buffer standards; and the regulation of new agricultural uses. See SMA Policy Papers at http://www.ecy.wa.gov/programs/sea/SMA/st_guide/SMP/index.html (accessed June 1, 2005).

Implementation of the Shoreline Master Program

Shoreline Master Programs are created with the intention they will be implemented and that development in shoreline areas will be regulated per the policies set forth in the SMP. To improve the implementation of Klickitat County's SMP, CPW's recommendations emphasize refining the permitting process, maintaining strategic partnerships, and increasing wetland identification. CPW recommendations include:

- ♦ *Require more detailed information for all shoreline permits to enhance precision and consistency.* The County should require tax-lot numbers and acreage of affected parcel(s) on each application. The County should also continue to require detailed site plans that delineate shoreline zones, wetlands, and exact dimensions of structures.
- ♦ *Maintain partnership with DOE.* The County and DOE should continue to partner in reviewing and conditioning shoreline permits. The County and DOE should also seek to review permits in-depth to identify conditions that are specific to site conditions.
- ♦ *Pursue wetland identification and protection.* Prior to adoption of the Critical Areas Ordinance (CAO) in 2004 the permitting process required applicants to identify whether wetlands exist on the subject site. It is probable that many applicants did not have the capability of assessing whether a wetland existed on their property. The CAO requires the County to utilize the National Wetlands Inventory (NWI) to identify any existing wetlands on the subject property at the time applications are submitted. If wetlands exist, the County should require the applicant to hire a third party to delineate the wetlands.

Monitoring the Shoreline Master Program

Although monitoring can be a time-intensive, cumbersome process, it helps gauge the effectiveness of actions and provides a baseline assessment against which future actions may be evaluated. To improve the County's SMP monitoring practices, CPW recommends establishing new reporting procedures and forming partnerships to identifying sensitive shoreline areas. CPW recommendations include:

- ♦ *Utilize the technical expertise of local Watershed Planning Units (WPU) to delineate and monitor wetlands and other measures of shoreline health.* As organizations comprised of local citizens who are concerned with the environmental health of the community, WPUs may assist in performing needed monitoring activities that are of value to the County.

Public outreach efforts of the Shoreline Master Program

Public education is an essential component of achieving SMP goals that aim to protect environmentally sensitive areas from unregulated, potentially destructive development. The County currently provides information for property owners on the shoreline-permitting process. CPW recommends expanding the County's public education program through enhancing existing public outreach efforts. CPW recommendations include:

- ♦ *Make informational pamphlets available to the public at the County Planning offices and other civic facilities throughout the County.* The County currently provides informational pamphlets to the public on the County web site. The County should provide hard copies of these pamphlets at city hall and other civic facilities to increase distribution. The County should also provide pamphlets and other outreach materials in Spanish to target the growing Hispanic minority in the area.

Conclusion

The Yakama Indian Nation can play an integral role in the implementation and enforcement of the SMP. The Tribes should continue to work with the County to monitor development permits in areas of interest. The Tribes should also consider partnering with local land-conservation organizations to acquire lands of strategic interest as a means to protect shoreline health.

CPW recommendations aim to improve the implementation and the effectiveness of the Klickitat County SMP. At the most basic level, the County should revise its SMP to meet new DOE guidelines and to better integrate existing ordinances that regulate environmentally sensitive areas. The County should also enhance public education efforts to increase awareness of SMP regulations and permitting procedures.

For future evaluation efforts, more detailed spatial data should be obtained or created. Having a varied, up-to-date, and comprehensive collection of spatial data that accurately portray development patterns and vegetation types may enhance future analyses of the SMP and other regulations. Overall, more detailed spatial data may, ultimately, contribute to more accurate evaluation efforts that, in turn, may strengthen the protection, preservation, and restoration of shoreline environments throughout Klickitat County.

Appendix A

Development Impact Analysis

Methodology

To analyze the impacts of development on the Klickitat and Little Klickitat Rivers, CPW used existing GIS data when available and created geographic information system (GIS) coverages when existing data was not available. Most GIS coverages CPW created were from analysis of aerial photographs³⁵. This enabled CPW to create spatially correct GIS coverages from aerial photographs. The following appendix provides a detailed outline of the methods of GIS analysis employed during this project.

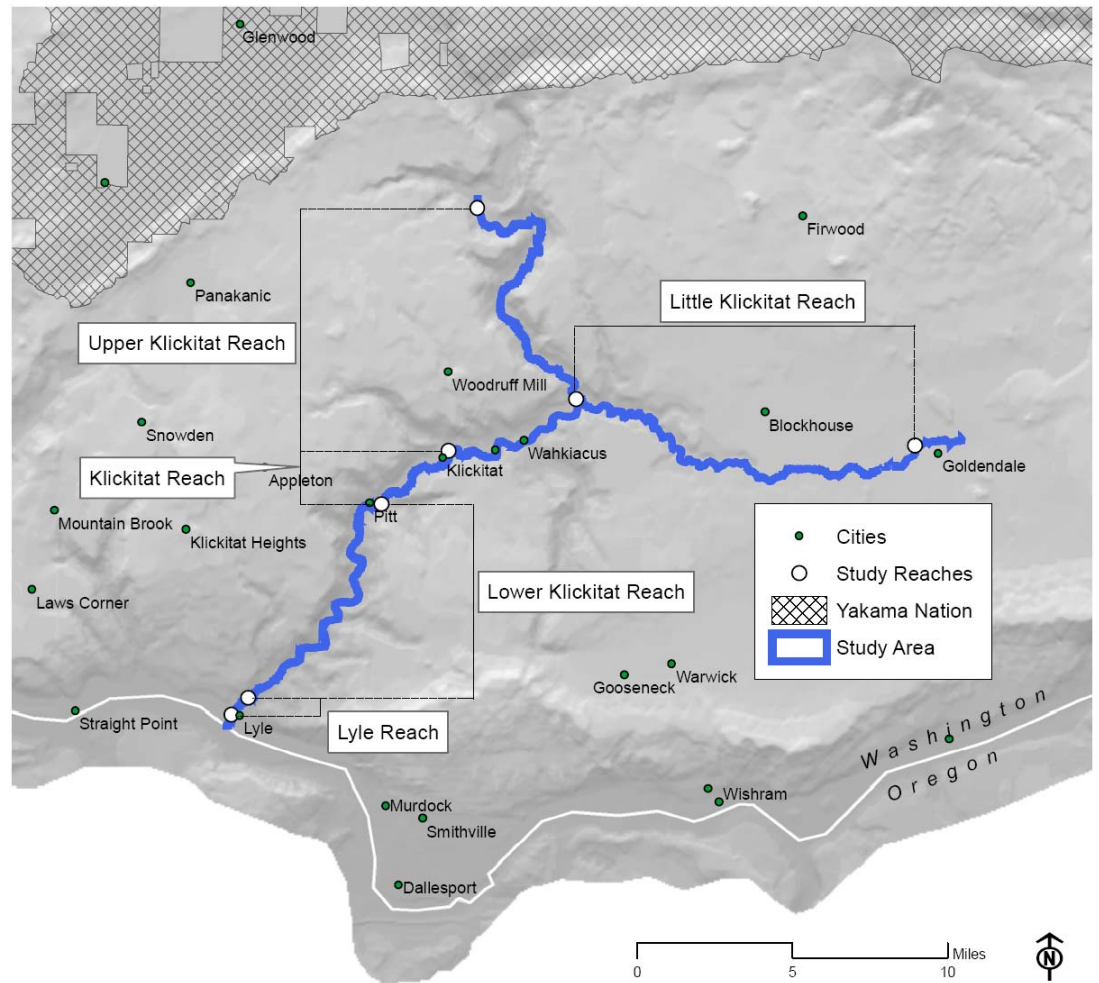
Study Area

CPW divided the study area into five reaches for the purpose of comparing development impacts between sections of the rivers (Figure A-1). Each reach is characterized by a unique combination of topography, climate, vegetation, wildlife, and land-use. The reaches identified for this study include:

1. Lyle: from the mouth of the Klickitat to the northern edge of Lyle (45 acres/1.2 miles);
2. Lower Klickitat: from the northern boundary of City of Lyle to the southern edge of the City of Klickitat (496 acres/10 miles);
3. Klickitat: the City of Klickitat (167 acres/3.3 miles);
4. Upper Klickitat: from the northern boundary of the City of Klickitat to the northern end of the study area (835 acres/16.8 miles); and
5. Little Klickitat: the Little Klickitat River from its confluence with the Klickitat River to the outskirts of Goldendale (734 acres/15.5 miles).

³⁵ CPW utilized digital orthoquads (DOQs). DOQs are digital aerial photographs that have been spatially referenced so they can be displayed in GIS software and geographically aligned with other data coverages.

Figure A-1. Geographic scope and study reaches



Source: Yakima Nation, 2004; CPW, 2005.

CPW analyzed the following for each reach:

- Zoning and SMP Shoreline Environments including physical areas and development activities within each
- Structures
- Areas impacted by development
- Roads
- Wetlands
- Distribution of Development

The ArcGIS buffer wizard was used to create 50-, 100-, 200-, and 500-foot buffers around the Klickitat and Little Klickitat Rivers. The 50-foot and 100-foot buffers are common boundaries for

development outlined in the Shoreline Master Program (SMP)³⁶. For the purpose of development impact analysis (Chapter 5), CPW limited the study to areas within 500 feet of the Klickitat or Little Klickitat Rivers. This was done to provide information about development trends outside the 200-foot shoreline area under jurisdiction of the SMP.

Data Sources

In general, CPW acquired data for analysis from the following sources:

- 1996 black and white aerial photos from the USGS;
- 2002 color aerial photos from WA Department of Transportation (WSDOT);
- GIS coverage of county roads from WSDOT;
- 'Year structures built' US Census 2000 data obtained through ESRI;
- Wetlands GIS coverage from the USFW National Wetland Inventory;
- County zoning GIS coverage provided by the Confederated Tribes of the Yakama Nation. No metadata was provided about the original source;
- Large format paper map of Shoreline Environment Designations provided by the Klickitat County Planning Department; and

In addition to these external data sources, CPW created four coverages to analyze development impacts to shoreline areas, including:

- Structures visible in 1996 and 2002 – based on aerial photos;
- Areas of impact to riparian vegetation – based on aerial photos;
- Highways, paved roads, and gravel/dirt roads not included in the WSDOT highway coverage – based on aerial photos; and
- SMP Shoreline Environment Designation coverage – based on paper copy of Designations map and SMP definitions.

³⁶ The water body polygon coverage CPW used for this analysis does not provide metadata regarding its origin. However, the data matches the USFW National Wetlands Inventory coverage of wetlands. CPW suspects that the water bodies coverage was created by USFW.

Zoning and Shoreline Environments

To determine the extent to which the SMP is achieving the goals of the Shoreline Management Act, it is important to know the allowed types of development and the locations where they are allowed.

CPW was provided with a GIS coverage of the county zoning for Klickitat County, but only a paper copy of the Shoreline Environment Designations was available. This paper copy and the shoreline definitions in the SMP were used to create a GIS coverage of Shoreline Environment Designations for the study area.

To describe the allowable development in the study area, the area of each zone and Shoreline Environment Designation was calculated and summarized by river reach. The number of structures in each zone and Shoreline Environment Designation was also calculated and summarized by river reach for both 1996 and 2002 to determine the rate of development.

The need to create a GIS coverage of Shoreline Designations introduced some human error. However, CPW first used a paper copy of the Shoreline Environments map to estimate their location, then honed the coverage using the SMP definitions³⁷ of these areas. This method parallels the way County Planning Staff identify Shoreline Environments for shoreline permit.

For the limitations associated with identification of structures from the aerial photos, see the *Structures* section below.

Structures

CPW identified where structures were built to identify development trends in terms of the SMP. To address this objective, CPW identified the locations and types of structures that have been built within 500 feet of the Klickitat and Little Klickitat Rivers.

USGS aerial photographs from 1996 and WSDOT aerial photographs from 2002 in the form of digital orthoquads (DOQs) were used to ascertain the locations and types of structures built within 500 feet of the rivers in the study area.

First, CPW identified the locations of structures within 500 feet of the Klickitat or Little Klickitat Rivers. Obvious structures were identified directly from DOQs. Less obvious structures were identified indirectly from the following features:

- Shadows cast by the structures;
- Uneven dark areas on the 1996 DOQs that were obvious structures in the 2002 DOQs;

³⁷ Klickitat County Shoreline Master Program, Legal Descriptions and Map Insert, 1996.

- Driveways or parking lots; and
- Rectilinear shapes that did not appear to occur naturally.

Next, CPW typified structures utilizing the following criteria:

- Residences:
 - Are at least 12' x 24';
 - Have driveways and don't have parking lots; and
 - Have lawns.
- Accessory structures, such as garages and sheds:
 - Are smaller than 12' x 24';
 - Are close to another structure; and
 - Are square or rectangular.
 - Have a connecting driveway
- Commercial/Industrial structures:
 - Are at least 12' x 24';
 - Have a parking lot;
 - Are square or rectangular; and
 - Are located near the highway.
- Unknown:
 - If structures did not clearly fall into one of the preceding categories or were exceedingly difficult to identify, they were classified as *Unknown*.

In some cases, it was possible to identify structures because they were in the middle of a cluster of structures that all fit into the same category.

Finally, to determine where future development is likely to occur, CPW identified areas of potential development. These areas were identified utilizing fieldwork and are based on topography, zoning, access to the area, and proximity to existing development (Table A-1)

Table A-1. Criteria for rating level of potential development

	Low	Medium	High
Topography	Steep, rocky terrain: no development	Moderately steep: Clearing and Grading	Fairly flat: Clearing
Zoning*	County: Open Space; Extensive Agriculture SED: Natural	County: Rural Residential (1 and 2) SED: Conservancy	County: Rural Center; General Rural; Suburban Residential; Residential; Industrial SED: Community; Urban/Industrial
Access	No roads	Rural roads: gravel/paved	Community roads; highways
Density	Highly developed	Low density, with high level of open space	Land that is adjacent to high development, with open space and utilities

* County = County Zoning; SED = SMP Shoreline Environment Designation.

Source: CPW, 2005.

The most recent available DOQs are from 2002, so some development may have occurred since these photographs were taken. However, the difference between the 1996 analysis and the 2002 analysis still provides a good idea of development trends in the study area.

Some structures are hidden from view or obstructed, such as those under tree canopies. CPW performed field research to confirm the existence of these structures by noting locations of structures that were not visible in the DOQs.

The resolution of the DOQs is 1m² and 3ft² per pixel for 1996 and 2002 respectively. The resolution made it difficult to categorize structures by type (i.e., residential, commercial, etc.) (Figure A-2). Also, the 1996 DOQs are black and white, which limits the level of detail in some photos.

Figure A-2. Sample of DOQ resolution



Source: WSDOT aerial photo, 2002.

Development Impact Analysis

To compare the impacts of development on wildlife habitat between river reaches, CPW created a quantitative indicator of development.

Data Sources

USGS digital orthoquads (DOQs) from 1996 and WSDOT DOQs from 2002 were used to create a GIS coverage of impacted areas around structures within 200 feet of the Klickitat and Little Klickitat Rivers.

Impacted areas were identified and delineated from DOQs by:

- Cleared canopy cover (Figure A-3);

Figure A-3. Example of cleared canopy cover



Source: WSDOT aerial photo, 2002.

- Rectilinear de-vegetation patterns;

- Areas adjacent to structures, roads, or driveways;
- Known parks, fisheries, bridges, etc.; and
- Plow patterns on agricultural fields.

From this GIS coverage of impacted areas, the area and number of structures within each area were calculated and summarized. Then, the distance from the center of each impacted area to the nearest river bank was calculated. From these three variables, an Impact index was calculated where:

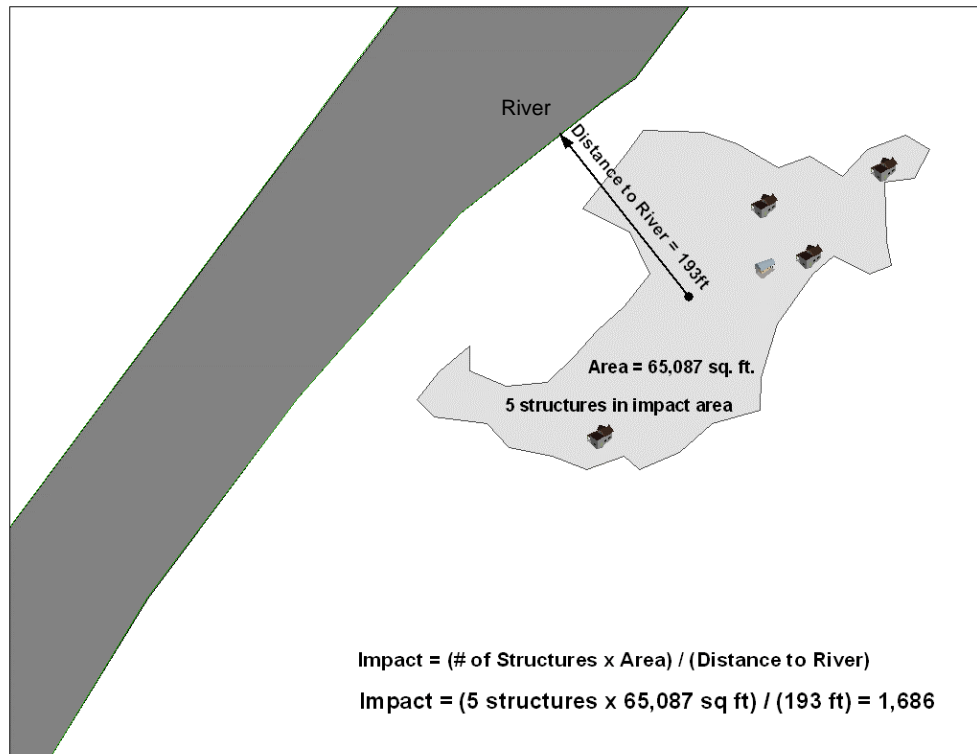
$$\text{Impact} = \frac{(\# \text{ structures in an area } \times \text{ the impacted area in sq. ft.})}{(\text{distance from the nearest river in feet})}$$

This indicator was summarized for each river reach as well as divided by the length of each reach to get impact per river mile (Figure A-4).

If a developed area fell both inside and outside the shoreline zone (200-foot buffer), the entire area and any structures in it were included in the impact analysis. However, only the area within the shoreline area was included for the purpose of calculating the amount of developed area that is regulated by the SMP.

This quantitative impact analysis was used in conjunction with field observations to assign a high, medium, or low impact to each river reach and shoreline designation.

Figure A-4. Quantitative method for calculating impact of a developed area



Source: CPW, 2005.

The resolution of the DOQs made identification of some of the impacted areas difficult. Furthermore, impacted areas that are obscured by trees or other features in the DOQs are likely underrepresented by this analysis. Therefore these Impact figures probably underestimate the extent of development impacts, but for the purposes of this project this issue does not affect the overall conclusions presented in this report. Finally, the Impact index was developed to provide a means of comparison between river reaches and does not capture all types of development impacts.

Roads

Roads significantly impact water quality through construction and maintenance methods. To determine the amount of impact caused by roads to the Klickitat and Little Klickitat Rivers, CPW analyzed the extent of road development along shoreline areas.

DOE provided a GIS coverage of county roads, which CPW supplemented by identifying roads within 200 feet of the Klickitat or Little Klickitat Rivers from the 2002 WSDOT DOQs.

To determine the extent of impact on the rivers from roads in shoreline areas, CPW calculated the length of roads within 50, 100, and 200 feet of the Klickitat or Little Klickitat Rivers. These roads were then classified into the following categories:

- **Highways** are the county highways from the WSDOT GIS coverage.
- **Paved roads** have a clearly visible centerline, but are not county highways.
- **Dirt/gravel roads** are roads and driveways longer than 100 feet that are not paved. These categories were grouped together because it is difficult to distinguish dirt roads from gravel roads.

CPW then measured the average width of each road type to determine the area of impact. The area of impact was determined by multiplying the average width of the road type by the length of road in shoreline areas. The average widths were determined to be:

- Highways and paved roads: 24 feet + 8 foot shoulders = 40 feet total average width.
- Dirt/gravel roads: average of 12 feet (dirt) and 20 feet (gravel) = 16 feet average width.

The existing GIS coverage only included Highway 14 and Highway 142. Therefore, CPW needed to identify additional roads from digital orthoquads (DOQs). This process introduced an additional level of human error. This identification was also difficult due to the resolution of the available DOQs. Finally, some roads are closed to the public, but this could not be determined from aerial photograph analysis.

Wetlands

Wetlands are an important part of wildlife habitat and much of the Klickitat river system includes wetlands. The Klickitat Critical Areas Ordinance regulates where development can occur relative to wetlands. Therefore, it is important to understand how development has impacted wetlands.

U.S. Fish and Wildlife (USFW) publishes a National Wetlands Inventory (NWI).³⁸ This data was downloaded as a GIS coverage. In addition to the NWI, CPW used the GIS coverage of structures in the study area to analyze development near wetlands.

The wetland analysis was limited to shoreline areas within 200 feet of the Klickitat and Little Klickitat Rivers where the SMP has

³⁸ USFW National Wetlands Mapper, http://wetlands.fws.gov/mapper_tool.htm (accessed February 5, 2005).

jurisdiction. The area of wetlands was calculated and summarized by river reach and type of wetland (as provided by the NWI).

The ArcGIS buffer wizard was used to create 300-foot buffers around wetlands to represent the area where the Critical Areas Ordinance limits development. CPW then calculated the number of structures within 500 feet of the rivers *and* less than 300 feet from wetlands.

Rivers tend to meander over time. It is likely that the Klickitat and Little Klickitat Rivers have moved since the NWI was completed in the 1980s. Therefore, the wetlands spatial analysis in Chapter 5 is provides an indication of the extent of development in areas that likely contain wetlands.

Also, most of the structures within 300 feet of wetlands were built before the Klickitat Critical Areas Ordinance that regulates development near wetlands was adopted in 2004.

Appendix B

Development Impacts Literature

Several studies (Leith and Whitfield 2000; Thibault 1997; Wentz 2000; Medina 1990) gauge the impact of development and land-use change on aquatic systems at a watershed level. A widespread consensus exists that land uses within a watershed can severely impact the water quality of streams and rivers draining that watershed (Wentz 2000). As Wentz (2000) points out, the types and locations of land uses within a watershed should be considered when assessing the land-use impacts on a watershed. For example, if drainage ways are protected (i.e. forested), upland agricultural activity may not adversely impact water quality.

Development can have several negative impacts on water resources and associated habitats. A review of the literature finds:

- ♦ That land uses alter the chemical and physical properties of surface and sub-surface water as it drains through the watershed (Wentz 2000);
- ♦ That a small amount of urbanization can significantly alter flow regimes, increasing the likelihood of flooding events (Leith and Whitfield);
- ♦ That urbanization impacts are more severe than historical land-use practices (Weiler and Theobald 2003);
- ♦ That agriculture is the leading cause of river impairment in the United States (Karr, Allan, and Benke 2000);
- ♦ That cultural activities (e.g., water diversions, groundwater pumping, changes in land use) associated with residential development affect streamflow, which can threaten riparian plant communities (Medina 1990);
- ♦ That riparian vegetative buffers (e.g., forests) aid in the removal of pollutants (e.g., heavy metals, nutrients, road salt, organics, petroleum hydrocarbons) and the reduction of sediment in streams, lakes, and rivers (Thibault 1997).

Some specific statistics from recent studies include:

- ♦ 89 percent of the nitrogen in runoff was removed by riparian forest in Maryland (Thibault 1997);
- ♦ 86 percent of the nitrogen in runoff was removed by riparian forest in North Carolina (Thibault 1997);

- ♦ A 16-meter-wide riparian forest buffer effectively removed most of the nitrate from groundwater (Thibault 1997);
- ♦ Riparian buffers of 100 feet or more filter 80 percent of phosphorus in runoff and decrease sediment loading (Markham 2002);
- ♦ 36 percent of surveyed river lengths in the US were impaired, with agriculture being the leading cause of impairment (bacteria and sediments were the leading pollutants) (Karr, Allan, and Benke 2000).

Karr, Allan, and Benke (2000) point out that the discharge of chemical contaminants is the most widely recognized negative effect of human activity on rivers, lakes, and streams. However, as Table B-1 shows, there are several factors that contribute to riparian degradation.

Table B-1. Five attributes of water resources altered by the cumulative effects of human activity, with examples of degradation in Pacific Northwest watersheds

Attribute	Components	Degradation in Northwest watersheds
Water quality	Temperature; turbidity; dissolved oxygen; acidity; alkalinity; organic and inorganic chemicals; heavy metals; toxic substances	Increased temperature Oxygen depletion Chemical contaminants
Habitat structure	Substrate type; water depth and flow velocity; spatial and temporal complexity of physical habitat	Sedimentation and loss of spawning gravel Obstructions interfering with movement of adult and juvenile salmonids Lack of woody debris Destruction of overhanging banks and riparian vegetation Lack of deep pools Altered abundance and distribution of constrained and unconstrained channel reaches
Flow regime	Water volume; flow timing	Reduced low flows and increased high flows limit survival of salmon and other aquatic organisms at various phases in their life cycles
Food (energy) source	Type, amount and size of organic particles entering stream; seasonal pattern of energy availability	Altered supply of organic material from riparian corridor Reduced or unavailable nutrients from the carcasses of adult salmon and lampreys after spawning
Biotic interaction	Competition; predation; disease; parasitism; mutualism	Increased predation on young by native and alien species Overharvest by sport and commercial fishers Genetic swamping by less-fit hatchery fish Alien diseases and parasites often associated with hatchery of aquaculture operations

Source: Karr, Allan, and Benke, 2000.

Recommended Sources

Karr, J.R., J.D. Allan, and A.C. Benke. 2000. River conservation in the United States and Canada. In *Global Perspectives on River Conservation: Science, Policy, and Practice*, ed. P.J. Boon, B.R. Davies, and G.E. Retts. England: John Wiley and Sons, ltd.

Leith and Whitfield. 2000. Some effects of urbanization on streamflow records in a small watershed in the Lower Fraser Valley, B.C. *Northwest Science* 74(1): 69-75.

Markham, Lynn. 2002. Siting rural development to protect lakes and streams and decrease road costs. Accessed on-line at <http://www.uwsp.edu/cnr/landcenter/tracker/fall2002/sitingruraldev.htm> (March 31, 2005).

Medina, A.L. 1990. Possible effect of residential development on streamflow, riparian plant communities, and fisheries on small mountain streams in Central Arizona. *Forest Ecology and Management* 33-4(1-4): 351-361.

Thibault, Philippe A. 1997. Ground cover patterns near streams for urban land use categories. *Landscape and Urban Planning* 39:37-45.

Weiler, Stephan and David Theobald. 2003. Pioneers of rural sprawl in the Rocky Mountain West. *The Review of Regional Studies* 33(3): 264-283.

Wente, Stephen P. 2000. Proximity-based measure of land use impacts to aquatic ecosystem integrity. *Environmental Toxicology and Chemistry* 19(4): 1148-1152.

Appendix C

Klickitat SMP Section 3

This appendix provides a copy of the Klickitat County Shoreline Master Program: Section 3.³⁹

SHORELINE ENVIRONMENTS

The shoreline environment designations established under the Shoreline Management Act are one of the principle tools for applying the general guidelines of the Act to local shorelines. In order to plan and effectively manage shoreline resources and to implement adopted goals and policies for shoreline management, five shoreline environmental designations are provided for the Klickitat County Master Program:

- ◆ Natural Environment
- ◆ Conservancy Environment
- ◆ Rural Environment
- ◆ Community Environment
- ◆ Urban/Industrial Environment

The purpose of these designations is to provide a uniform basis for applying management criteria within distinctively different shoreline areas and with different objectives regarding their use and development. Environmental designations for shorelines of Klickitat County are illustrated on maps in the Shoreline Management Plan Supplement. Use limitations in the shoreline Natural Buffer Zone and five shoreline environments are provided in Section Four.

SHORELINE ENVIRONMENTS NATURAL BUFFER ZONE

Within all environments designated as shorelines of Klickitat County is an area called the Natural Buffer Zone? The purpose of this zone is to establish an undisturbed conservation buffer of natural vegetation in order to preserve the natural shoreline riparian zone; to assure water quality; to preserve aesthetic qualities along shorelines, and to enhance and preserve unique natural resources for the benefit of existing and future generations and the public interest. ("Undisturbed"... allows only minor vegetative modification that does not substantially alter visual character or adversely affect riparian structure and function.) All

³⁹ Klickitat County Shoreline Master Program, 1996.

structures will require a setback of 50 feet from the ordinary high water line for all development other than for flood control, erosion control, water dependent uses, or access to banks. This zone applies to all environmental designations, and meets the criteria as shown on the diagram as shown below: Measured 50 feet shoreward on a horizontal plane from the ordinary high water line.

NATURAL ENVIRONMENT

The purpose of the Natural Environment is intended to preserve and restore those natural resource systems existing relatively free of human influence and those shoreline areas possessing natural characteristics intolerant of human use or unique aesthetic, historical, cultural, and/or educational features. These systems require severe restrictions on the intensities and types of uses permitted so as to maintain the integrity of a shoreline environment. The criteria for the Natural designation should meet one or more of the following:

Wildlife Habitat

- A shoreline area that provides food, water, or cover and protection for any rare, endangered or diminishing species;
- A seasonal haven for concentrations of native animals, fish or fowl, such as migration route, breeding site or spawning site;

Areas of Scientific and Educational Value

- Areas considered best to represent basic ecosystems and geologic types that are of particular scientific and educational interest.
- Shoreline areas which best represent undisturbed natural areas;
- Shoreline areas with established histories of scientific research;

Areas of Scenic or Recreational Value

- Those shoreline areas having an outstanding or unique scenic feature in their natural state;
- Shoreline areas having a high value for wilderness experience;
- Areas having a high value in their natural states for low intensity recreational use; the natural environment is also characterized by severe biophysical limitations, presence of unique natural, cultural, and/or aesthetic features, intolerant of intensive human use, and considered valuable in its natural or original condition. Master Plan objectives are oriented toward preserving unique features, restricting

activities which may degrade the actual or potential value of this environment, and severely restricting development in hazardous areas.

CONSERVANCY ENVIRONMENT

The purpose and intent of the conservancy environment is to protect, conserve and manage existing natural resources and/or unique, valuable, aesthetic, historic, and cultural areas in order to achieve sustained resource utilization and provide recreational opportunities. The conservancy environment is also intended to protect environmentally sensitive areas which are not suitable for intensive use, such as steep slopes, flood-prone areas, eroding bluffs, natural wetlands, and areas which cannot provide adequate sewage disposal.

The conservancy environment is characterized by very low intensity land uses primarily related to natural resource use and diffused recreational development, relatively low land values, relatively minor public and private capital investment, and/or relatively severe biophysical limitations. Examples of uses that are appropriate in a conservancy environment include dispersed outdoor recreation activities, timber harvesting on a sustained yield basis, passive agricultural uses such as approved grazing, and/or non-intensive cultivation practices. The preferred uses are those which are non-consumptive of the physical and biological resources on a sustained basis while minimally reducing opportunities for other future uses of the resources in the area. Activities and uses of a non-permanent nature which do not substantially degrade the existing character of the area are preferred uses for the Conservancy Environment. The right of residential development, of limited density, on private lands, is recognized, with limitations.

RURAL ENVIRONMENT

The Rural Environment is characterized by intensive agriculture or recreational use, moderate land values, lower public and private capital investment, and/or some biophysical development limitations. The master plan objectives are to protect agricultural lands, maintain open spaces, and provide for recreational uses which are compatible with agricultural activities. The Rural Environment is intended to protect agricultural land from Urban Expansion. Those areas having high capability to support active agriculture or which have agriculture potential should be maintained for present and future needs. They include areas which have a potential for agriculture purposes or are already being used for agriculture purposes. Low density rural residential and moderate intensity recreational uses are types appropriate to the resources of the areas.

COMMUNITY

The Community Environment is characterized as an area of moderate intensity land use including residential, recreational and commercial development. The environment covers basically all unincorporated areas and is intended to encourage residential, recreational and commercial development to locate within this environment. It is particularly suitable to those areas presently planned to accommodate Community expansion. Although somewhat limited by the kind and quantity of services available, the opportunities are related to characteristics of a small community: 1) employment, 2) recreation, 3) business and commerce, 4) manufacturing, and 5) low cost retirement living.

The limitations are characteristic of a small community: 1) available space, 2) remote location, 3) public transportation, 4) school curriculum, 5) employment variety, and 6) cultural variety.

URBAN/INDUSTRIAL ENVIRONMENT

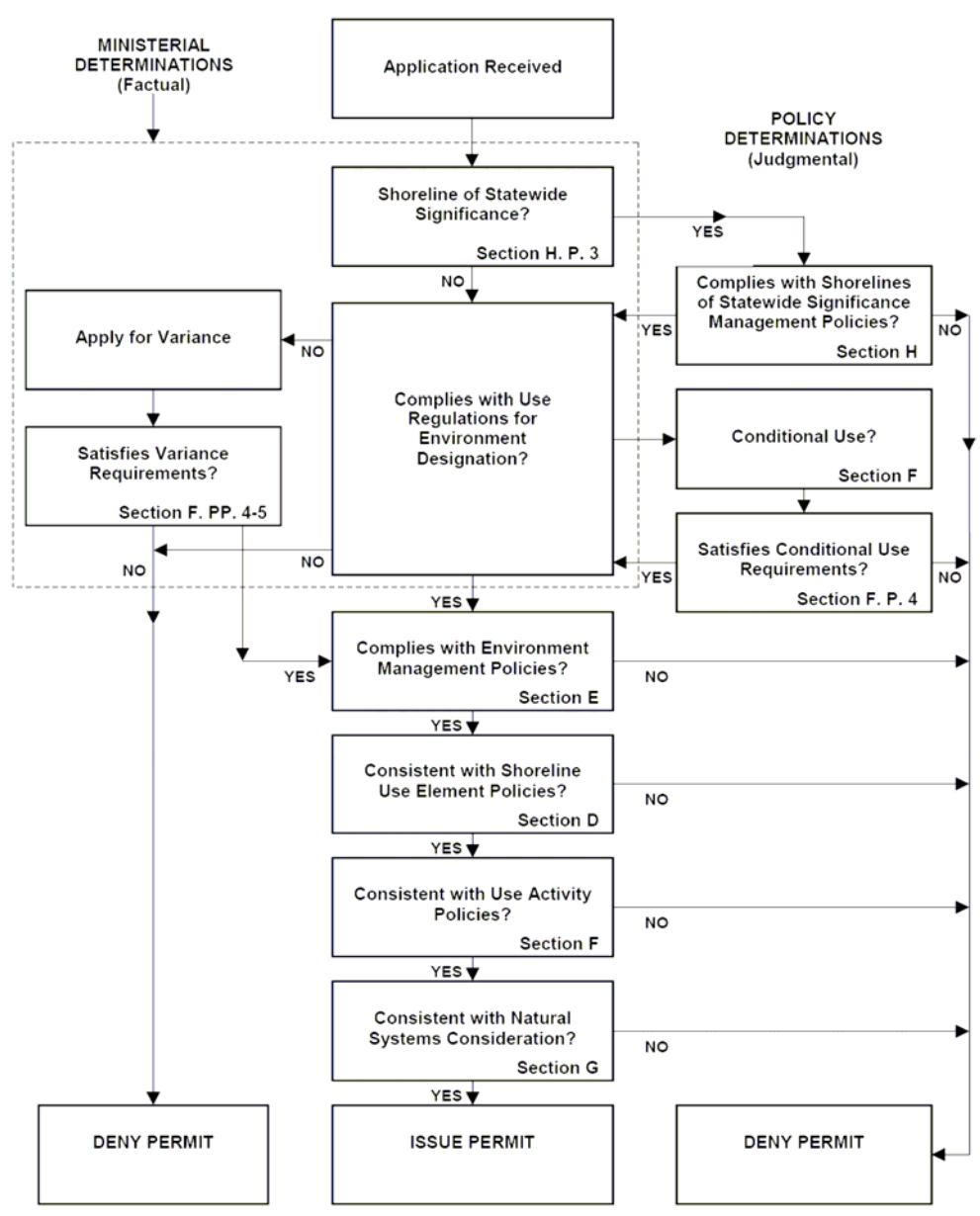
The Urban/Industrial Environment is a shoreline area characterized by high intensity and diverse land uses such as commercial and industrial development, as well as community facilities. The purpose of assigning an area to an urban/industrial environment is to ensure optimum utilization of shorelines occurring in industrial areas by providing for manufacturing, commercial, high density residential and industrial uses, and providing for orderly future development. The resources characteristic of this environment is those necessary to the uses of such an environment: (1) electrical, domestic water, and sewage utilities, (2) shipping and transportation.

Appendix D

Permit Evaluation Process

The Klickitat County Planning Department implements and enforces the Shoreline Master Program by reviewing, issuing, conditioning, and denying shoreline development permits. Figure D-1 illustrates the typical shoreline development permit evaluation process.

Figure D-1. Shoreline development permit evaluation process



Source: Snohomish County Shoreline Master Program, 2004.

Appendix E

County Zoning Summary

The intent of the Klickitat County Zoning Ordinance⁴⁰ is to create uniform districts in which compatible uses are encouraged. The ordinance was adopted to provide equitable and reasonable standards to govern the usage of land and structures in the interest of the public health, safety and the general welfare. The ordinance uses policy and police power to guide development by delineating zones according to potential development types. Changing conditions and requirements dictate that a flexible policy be exercised within the framework of this ordinance. Standards are determined to be the minimum requirements to ensure the community achieves the objectives of the Comprehensive Plan.

Specifically, Klickitat County's zoning ordinance prescribes: (1) standards for reach districts; (2) density controls; (3) procedures and conditions for granting variances; and; (4) provides procedures for administration, appeal, amendments and enforcement and penalties.

The study area includes ten county zones, including: Suburban Residential, Residential, General Rural, Open Space, Rural Residential 2, Rural Center, Public, General Industrial, Extensive Agriculture, and Industrial Park. Each zone contains its own set of permitted activities, which are described in the following table

⁴⁰ Klickitat County Zoning Ordinance, <http://www.klickitatcounty.org/Planning/FilesHtml/ZoningPDF/01-Ordinance.pdf>, (accessed June 1, 2005).

Table E-1. Zoning Details

Description	County Zone				
	Suburban Residential (SR)	Residential (R)	General Rural (GR)	Open Space (OS)	Rural Residential 2 (RR2)
Uses Permitted	Single-Family Dwelling, Home occupation, Agriculture (w/o intensive animal production)	Single-family dwelling, duplexes, mobile homes w/ criteria, mobile home parks, home occupation	Agriculture, Single-family dwelling, home occupation, agricultural-use buildings	Single Family Dwelling, mobile home, agriculture, recreation, conservation	Agriculture, Single-family dwelling, mobile home, home occupation, agriculture-use buildings, forest uses
Conditional Uses	mobile home park, +13	11	mobile home park, +16	10	Commercial/industrial agricultural activity, mobile home park, +15
Accessory Uses Permitted	Garages, non-commercial parking areas, other	Garages, non-commercial parking areas, other	garage, other	garage, non-commercial parking, other	garage, non-commercial parking areas, other
Density Regulations	Minimum lot size: 20,000 sq. ft Dwelling Units per lot: 1	Minimum lot size: 6,000 sq ft. w/ community sewer system. 20,000+ sq ft. w/o sewer system Dwelling units per lot: 1-7	Minimum lot size: 5 acres Dwelling units per lot: 1*	Minimum lot size: 20 acres Dwelling units per lot: 1	Minimum lot size: 2 acres Dwelling units per lot: 1*
Set-back Regulations	Minimum width of lot: 100 feet Minimum yard depth, width & rear requirements	Minimum width of lot: 60 feet Minimum yard depth, width & rear requirements	Minimum width of lot: 100 feet Minimum yard depth, width, & rear requirements	Minimum yard depth, width, & rear requirements	Minimum width of lot: 100 feet Minimum yard depth, width, & rear requirements
Description	County Zone				
	Rural Center (RC)	Public (P)	General Industrial (GI)	Extensive Agriculture (EA)	Industrial Park (IP)
Uses Permitted	industrial/commercial agriculture use, business offices, single-family dwelling, mobile home, duplexes, other	Schools, parks, +6	Automobile wrecking, manufacturing, factories, lumber mills, +34	Farm use, Dwellings, mobile home, commercial/industrial agricultural use	Assembly, fabrication, and manufacturing of products, warehouses
Conditional Uses	mobile home park, +3	caretaker dwelling, +4	23 industrial type uses	8	Commercial businesses, farm co-ops, +15
Accessory Uses Permitted	incidental to principal use	incidental structure to principle use	Yes	Garage, incidental uses to principle use, +2	Yes
Density Regulations	Minimum lot size: 5,000+ sq ft Units per lot: Not specified	Minimum lot size: that necessary for intended use Units per lot: Not specified	Minimum lot size: None Units per lot: not specified	Minimum lot size: 20 acres, or 40 acres where designated Dwelling units per lot: 1	Minimum lot size: None Units per lot: Not specified
Set-back Regulations	Minimum yard depth, yard, & width requirements	Minimum yard depth, width, & rear requirements same as adjacent zoning	No requirements unless flanks or opposite residential zone	Minimum width of lot: 100 yards Minimum yard depth, width, & rear requirements	No requirements unless flanks or opposite residential zone

* Not specified in code--we assume 1 du per acre.

Source: Shoreline Master Plan and CPW, 2005.

Appendix F

Summary of Klickitat County Energy Overlay Zone FEIS

In 2004 Klickitat County completed its Final Environmental Impact Statement (FEIS) for the Klickitat County Energy Overlay Zone document. Energy developers are attracted to Klickitat County because of its predictable wind, solar energy resources, extensive electric transmission grid, high capacity natural gas pipeline, and biomass resources. With energy development interest comes certain challenges, such as how to plan for and mitigate environmental impacts of proposed energy projects.

The FEIS provides analysis of energy projects likely to be proposed in the foreseeable future; the environmental issues typically associated with energy projects; and, review/permitting processes intended to address environmental impacts. It is expected that future legislative actions will be informed by the FEIS, and future energy projects will rely on its environmental analysis.

The FEIS provides a Mitigation Summary that outlines potential mitigation actions that would offset potential impacts due to development of energy facilities. CPW reviewed the Mitigation Summary to identify the types of mitigation strategies that might be employed and the impacts on water and fish habitat these strategies may include. The types of energy facilities impacts reviewed in this Appendix include wind power, biomass, solar, and gas-fired energy generation.

Environmental Impacts and Potential Mitigation Actions

Wind Power

The most economical application of wind electric turbines is in groups of large machines (660 kW and higher), called "wind power plants" or "wind farms." These wind farms generate electricity while agricultural use continues undisturbed.

The environmental impacts and potential mitigation actions related to water, vegetation, and wildlife for wind power generation may include:

Impacts on Water

- The FEIS identified no significant impacts of wind power development on water and fish habitat.

Impacts on Vegetation and Wildlife (Fish)

- Construction along ridge tops can have short-term impacts on fish habitat because of runoff and sedimentation. Additionally, the interconnection of underground collector lines throughout strings of turbines could require stream crossings.

Potential mitigation actions

- During construction, conduct proper site management of stormwater and resultant sedimentation into nearby water bodies. Develop a Storm Water Pollution Prevention Plan (SWPPP) and implement Best Management Practices (BMPs) required by the National Pollution Discharge Elimination System (NPDES) stormwater permit program to reduce the potential for contamination of stormwater runoff and sedimentation.
- Constructing collector line crossings perpendicular to streams to reduce the area of in stream disturbances. Such crossings require a temporary stream diversion with work occurring during Washington Department of Fish and Wildlife (WDFW) designated in-water work periods.

Gas-Fired Energy Generation

Natural gas is the most common fuel used for gas-fired energy generation. Natural gas is preferred due to its low initial investment cost. Waste heat is also sometimes reused to support industrial processes that require heat.

The environmental impacts and potential mitigation actions related to water, vegetation, and wildlife for gas-fired power generation may include:

Impacts on Water

- Potential reductions in instream flows and additional drawdown on existing water supply wells; reducing instream flows could also create or exacerbate water quality impacts.

Potential mitigation actions

- Applications for water right changes address potential impacts. The applicant must demonstrate to the satisfaction of the Water Conservancy Board and Ecology that the proposed change/transfer would not impair existing water rights or pending applications, instream flows, or water quality, and is in the public interest.

Impacts on Public Service and Utilities

- The discharge of residue into wastewater systems may elevate levels of minerals and increase water temperatures in receiving water bodies.

Potential mitigation actions

- The developer should obtain permits for wastewater discharge (NPDES) and adhere to the permit requirements, which may demand pre-treatment of wastewater before disposal, or construction of improvements to public wastewater treatment facilities.

Biomass

Industrial biomass combustion facilities can burn many types of biomass fuel, including wood, agricultural residues, wood pulping liquor, municipal solid waste (MSW) and refuse-derived fuel. Combustion technologies convert biomass fuels into several forms of useful energy for commercial or industrial uses: hot air, hot water, steam and electricity.

The environmental impacts and potential mitigation actions to water, vegetation, and wildlife by biomass power generation may include:

Impacts on Water

- Development of biomass energy facilities may reduce instream flows and additional drawdown in existing water supply wells, which could exacerbate water quality impacts.

Potential mitigation actions

- Applications for water right changes address potential impacts. The applicant must demonstrate to the satisfaction of the Water Conservancy Board and Ecology that the proposed change/transfer would not impair existing water rights or pending applications, instream flows, or water quality, and is in the public interest.

Impacts on Vegetation and Wildlife (Fish)

- Short-term impacts to riparian areas may include runoff and sedimentation from construction.
- Storage of organic materials may contribute contaminants to surrounding water bodies, affecting fish habitat.

Potential mitigation actions

- Prepare a Storm Water Pollution Prevention Plan (SWPPP) and Spill Prevention Control and Counter Measures Plan (SPCC) to minimize contamination to rivers and streams.
- Construction of facilities across streams or wetlands should be avoided. Tunneling methods must be used when crossing is necessary to avoid impacts on fish habitat.
- Implement best management practices when storing and handling of organic materials, such as:

Covered storage for organic materials;
Stormwater treatment before discharge; and
Line the containment area.

Impacts on Public Service and Utilities

- Discharge of residue from biomass into wastewater system will elevate levels of minerals and increase water temperatures than receiving waters.

Potential mitigation actions

- The developer should obtain permits for wastewater discharge (NPDES) and adhere to the permit requirements, which may demand pre-treatment of wastewater before disposal, or construction of improvements to public wastewater treatment facilities.

Solar

Solar energy can be converted directly or indirectly into other forms of energy, such as heat and electricity. Solar energy is used for heating water for domestic use, space heating of buildings, drying agricultural products, and generating electrical energy.

Electric utilities use photovoltaics, a process by which solar energy is converted directly to electricity. Electricity can be produced directly from solar energy using photovoltaic devices or indirectly from steam generators using solar thermal collectors to heat a working fluid.

The environmental impacts and potential mitigation actions related to water, vegetation, and wildlife for solar power generation may include:

Impacts on Water

- There are no significant impacts identified by the EIS on water and fish habitat.

Impacts on Vegetation and Wildlife (Fish)

- Run-off and sedimentation in rivers due to construction activities may have short-term impacts on fish habitat.

Potential mitigation actions

- During construction, conduct proper site management of stormwater and resultant sedimentation into nearby water bodies. Develop a Storm Water Pollution Prevention Plan (SWPPP) and implement Best Management Practices (BMPs) required by the National Pollution Discharge Elimination System (NPDES) stormwater permit program to reduce the potential for contamination of stormwater runoff and sedimentation.

Conclusion

The FEIS Mitigation Summary outlines potential mitigation actions that would offset environmental impacts to shoreline areas by new energy facilities. The most common impacts in terms of water, vegetation, and wildlife resources include, increased run-off and sedimentation due to construction activities, reduced instream flows, and additional drawdown in existing water supply wells. Typically, the FEIS recommends employing Storm Water Pollution Prevention Plans and implementing Best Management Practices, which are required by the National Pollution Discharge Elimination System (NPDES) stormwater permit program.

The discharge of residue into wastewater systems is also a concern in terms of riparian habitat. Residue may elevate levels of minerals and increase water temperatures in receiving water bodies, which in turn affects vegetation, fish, and other wildlife. The FEIS tends to recommend that developers obtain permits for wastewater discharge, which may demand pre-treatment of wastewater before disposal, or construction of improvements to public wastewater treatment facilities.

The potential mitigation actions outlined above are relatively general and often rely on existing regulatory measures, which makes sense because the FEIS attempts to foresee environmental impacts of energy facility development.

Appendix G

Shoreline Regulations

Klickitat County guides development in shoreline zones with three regulations, including the Flood Plain Ordinance, Critical Areas Ordinance, and Shoreline Master Program. This suite of policies address shoreline management differently, depending on the purpose of the policy. The following table (Table G-1) presents a comparative analysis of the purpose, jurisdiction, and management approach of these three distinct land-use regulations.

Table G-1. Shoreline Regulations

	Flood Plain Ordinance (FPO)	Critical Areas Ordinance (CAO)	Shoreline Master Program (SMP)
Effective Date	6/28/81; revised 11/7/88	1/27/04	Revised 1996; approved 1997-8 (required to update every 2 yrs)
Purpose	To promote the public health, safety, and welfare and to minimize the private/public losses due to flood conditions	Part of State Growth Management Act (GMA); the GMA requires local governments to preserve critical areas for the public health, welfare; to protect fish and wildlife habitat, control floodwaters, preserve water quality and open space	Meet standards of WA Shoreline Mgmt Act of 1971; to protect shorelines from poor mgmt and destructive usage through the provision of safeguards and standards for shorelines of statewide significance.
Areas Affected	Applies to all areas of "special flood hazard" within the jurisdiction of unincorporated Klickitat County. Areas of "special flood hazard" are defined by FEMA—all land in the 100-year flood plain.	Applies to all activities (except those exempted) in unincorporated areas of Klickitat County. "Critical areas" include: wetlands, aquifer recharge areas, fish and wildlife habitat conservation areas, frequently flooded areas, geologically hazardous areas	Applies to all shorelines of statewide significance throughout Klickitat County. Areas affected: 1) all streams with mean annual flow >20 ft ³ /s; 2) lakes, impoundments, and reservoirs >20 acres; 3) lands extending landward 200' from OHWM or in the floodways; 4) wetlands in 100-yr. floodplain associated with shorelines of statewide significance. Establishes shoreline environments: natural, conservancy, rural, community, urban /industrial

	Flood Plain Ordinance (FPO)	Critical Areas Ordinance (CAO)	Shoreline Master Program (SMP)
Compliance Requirements	<p>Individuals must have a development permit before construction/development in special flood hazard (SPF) areas</p> <p>Individuals must fully comply with ordinance and regulations to construct, locate, extend, or convert a structure or land in SPF areas</p>	<p>Acts as an overlay of existing land use regulations</p> <p>Applies to all permits/land use appeals issued by Klickitat County.</p> <p>Establishes performance standards for critical areas</p>	<p>Acts as an overlay zone for shoreline areas</p> <p>Individuals must comply with requirements in SMP and other County regulation</p>
General Standards	<p>Anchoring – prevent flotation, danger</p> <p>Construction methods – flood resistant</p> <p>Utilities – minimize/eliminate infiltration H₂O</p> <p>Subdivision proposals – minimize flood damage</p>	N/A	*No development allowed in Natural Buffer Zone (50' from OHWM)
Residential	*Must have lowest floor above base-flood elevation	N/A	<p>*Site plans are required for development; must include procedures for preserving shoreline vegetation</p> <p>*Must comply with flood standards of FPO</p> <p>*Setbacks: 1) 100' from OHWM; 2) 50' for commercial/industrial/urban zones</p>
Floodways	<p>*Prohibits encroachments, new development, unless certified by registered professional</p> <p>*Prohibits construction/reconstruction of residential structures— unless minor improvements (less than 50% mkt. value)</p>	<p>*Addresses “frequently flooded areas”; defines as 100-year flood plain; defers to Klickitat FPO</p> <p>*Requires identification of flood plain; compliance with FPO; maintenance of pre-development movement of surface waters</p>	<p>*Included in “environmentally sensitive areas”</p> <p>*All development prohibited in floodways</p> <p>*All development in 100-yr floodplain shall: 1) not increase flood levels/restrict floodplain/floodway capacities; 2) be able to withstand 100-yr flood and not pose a hazard</p>

	Flood Plain Ordinance (FPO)	Critical Areas Ordinance (CAO)	Shoreline Master Program (SMP)
Wetlands	<p>*Avoid short/long-term adverse impacts with destruction of wetlands</p> <p>*Provides review process for identification of wetlands in flood plain; must protect ability to reduce flood and storm drainage; contact DOE, use NWI.</p>	<p>*Wetland larger than 2500 sq. ft., applicant must buffer 300' ft. +. If wish to develop, must mitigate per requirements</p> <p>*Buffers range 75'-300', depending on wetland category</p> <p><i>*Buffers can be averaged if development proven not to adversely affect wetland function/value. Buffers can range from 37.5'-150'</i></p> <p><i>*Standard mitigation ratios range from 2:1-6:1, depending on wetland category; minimum acreage replacement ratio is 1:1</i></p> <p>*Must have wetland mitigation plan</p>	<p>*No activity shall disturb wetlands unless the wetlands doesn't serve valuable function or development would preserve/enhance habitat</p> <p>*Must mitigate disruption of wetland, have mgmt. plan</p> <p><i>*Shall mitigate at minimum of 1.25:1.</i></p> <p><i>*An upland buffer are of at least 50' shall be required around and adjacent to all wetlands; can receive variance, but must mitigate</i></p>
Critical Fish/Wildlife Habitats	N/A	<p>*Critical wildlife habitat conservation areas are: 1) areas with fed/state endangered, threatened species; 2) habitats of local importance; 3) WA DNR natural preserves and natural conservation areas</p> <p>*Critical fish habitat conservation areas are: 1) naturally occurring ponds < 20 acres; 2) waters of the state; 3) lakes, ponds, rivers planted with game fish by governmental or tribal entity</p> <p>*Habitat mgmt plans required when habitat functions are impaired</p> <p>*Buffers for fish habitats range from 25'-200' (from OHWM), depending on water "type"; riparian buffers must remain, BUT a 25' view/access corridor may be cleared</p>	<p>*Included in "environmentally sensitive areas"</p> <p>*Requires areas that encompass valuable natural features to be left intact and maintained as open space or buffers; requires all development to be set back from these areas to protect values.</p>

	Flood Plain Ordinance (FPO)	Critical Areas Ordinance (CAO)	Shoreline Master Program (SMP)
Geologic Hazards	N/A	<p>*Areas are classified as erosion, landslide, seismic, volcanic, or mine-hazard areas</p> <p>*Several performance standards: Development sites for new structures identified with intermittent/perennial stream-side incision or erosion points shall have all structures located 100' away from such points</p>	<p>*Included in "environmentally sensitive areas"</p> <p>*Requires development to be located and designed to minimize or prevent need for stabilization measures</p> <p>*Development must use effective erosion control during construction and operation.</p> <p>*Surfaces cleared of vegetation must be replanted ASAP.</p>
Aquifer Recharge Areas	N/A	<p>*Designated areas include wellhead protection areas, sole-source aquifers, and susceptible groundwater mgmt areas.</p> <p>*Performance standards: parcels with septic systems are subject to minimum lot size standards; wells shall be setback at least 100' from adjacent lot lines;</p>	N/A
Agriculture	N/A	N/A	<p>*Prohibits use of herbicides and pesticides that may enter water bodies or wetlands, unless approved by appropriate agencies</p> <p>*Requires a vegetative buffer of at least 50' to be maintained between agricultural lands and water bodies or wetlands</p> <p>*The disposal of solid waste is prohibited in shorelines areas</p> <p>*All structures, unless water dependent, must be setback 100' from OHWM</p> <p>*Grazing Plan/Natural Resource Conservation District Farm Plan required for all uses proposed or continued within 200' of shorelines</p>
Forest Mgmt.	N/A	N/A	<p>*Selective timber harvesting methods only on shoreline of statewide significance</p> <p>*Logging must ensure groundcover in the 50' buffer zone</p>

	Flood Plain Ordinance (FPO)	Critical Areas Ordinance (CAO)	Shoreline Master Program (SMP)
Clearing and Grading	N/A	N/A	*Grading and clearing w/in 50' buffer requires a conditional use permit; w/in 50'-100', permitted use as long as 75% of vegetation is maintained; 100'-200', no restrictions

Appendix H

DOE Exemption Letters

The SMA exempts certain developments from the need to obtain an SDP including: single-family residences; normal protective bulkheads for single-family residences; normal maintenance and repair of existing structures; docks worth less than \$2,500 (salt water) or \$10,000 (fresh water); normal farming activities; and emergency construction needed to protect property. Exempted activities must still comply with all substantive policies and regulations of the SMP.

If an applicant meets the requirements of exempted developments the County Planning Department issues notice of exemption to the DOE. The DOE provided CPW with permit exemption information (letters), dated from August 2001 to October 2004. CPW assumes that exemption letters prior to August 2001 are stored at the State archives.

Figure H-1. Exemption letter #1

KLICKITAT COUNTY PLANNING DEPARTMENT

228 W. Main Street, MS-CH-17
Goldendale, WA 98620

509-773-5703
1 800 765-7239
FAX 509-773-6206

EXEMPTION FROM SHORELINE MANAGEMENT ACT SUBSTANTIAL DEVELOPMENT PERMIT REQUIREMENT

TO: Washington State Department of Fish and Wildlife
Region 3
1701 South 24th Street
Yakima, WA 98902-5720

The proposal by the Washington State Department of Fish and Wildlife is to implement drought related fish passage and protection projects within Klickitat County throughout the summer and fall months of 2001. The proposal is located on Swale Creek within portions of Sections 18, 19, 20, 28, and 33 of T4N, R14E. The proposal is also located on the Little Klickitat River within portions of Sections 9, 10, 11, 13, 14, 15, and 24 of T4N, R14E and within portions of Sections 19, 20, 21, and 28 of T4, R15E, W. M., Klickitat County. This proposal is exempt from the requirement of a substantial development permit because the developments are considered:

- A public or private project, the primary purpose of which is to improve fish or wildlife habitat or fish passage, when all the following apply.
 - (i) The project has been approved in writing by the Department of Fish and Wildlife as necessary for the improvement of habitat or passage and appropriately designed wildlife as necessary for the improvement of the habitat or passage and appropriately designed and sited to accomplish the intended purpose;
 - (ii) The project has received hydraulic project approval by the Department of Fish and Wildlife pursuant to 77.55 RCW; and
 - (iii) The Planning Department has determined that a project is consistent with local shoreline master programs. The local government shall make such determinations in a timely manner and provide it by letter to the project proponent.

1. Trenches for the power line shall be backfilled with native material
2. The power line shall be abandoned upon discontinuance of the project.
3. The project shall remain in conformance with provisions of the Shoreline Management Act and the Klickitat County Shoreline Plan.


Curt Dreyer, Klickitat County Planning Director

8/1/01
Date

Source: WA Department of Ecology, 2005.

Figure H-2. Exemption letter #2

KLICKITAT COUNTY PLANNING DEPARTMENT

228 W. Main Street, MS: CH-17
Goldendale, WA 98620

509-773-5703
1 800 765-7239
FAX 509-773-6206

**EXEMPTION FROM SHORELINE
MANAGEMENT ACT SUBSTANTIAL
DEVELOPMENT PERMIT REQUIREMENT**

**TO: Washington State Department of Transportation
Southwest Region
11018 Northwest 51st Circle
P.O. Box 1709
Vancouver, WA 98668-1709**

The proposal by the Washington State Department of Transportation is to bring shoulders along Highway 142 from Milepost 6.0 to Milepost 18.0 up to current safety standards. The proposal is located on the Klickitat River in Sections 5, 8, and 17 of T3N, R13E; Sections 13, 22, 23, 24, 27, 28, 29, 32, and 33 of T4N, R13E; and 16, 17, 18, and 19 of T4, R14E, W. M., Klickitat County. This proposal is exempt from the requirement of a substantial development permit because the developments are considered:

- Normal maintenance or repair of existing structures or developments, including damage by accident, fire or elements. "Normal maintenance" includes those usual acts to prevent a decline, lapse, or cessation from a lawfully established condition. "Normal repair" means to restore a development to a state comparable to its original condition within a reasonable period after decay or partial destruction except where repair involves total replacement which is not common practice or causes substantial adverse effects to the shoreline resource or environment; exemptions as outlined in WAC 173-14-040(b).

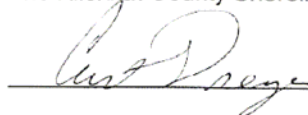
The proposed development is consistent or inconsistent with:

CONSISTENT INCONSISTENT

The WA State Shoreline Management Act
The Klickitat County Shorelines Master Plan

8/9/01

DATE



Curt Dreyer, Planning Director

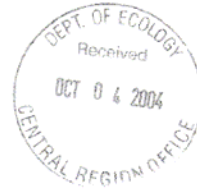
Source: WA Department of Ecology, 2005.

Figure H-3. Exemption letter #3

KLICKITAT COUNTY PLANNING DEPARTMENT

228 W. Main Street, MS: CH-17
Goldendale, WA 98620

509-773-5703
1 800 765-7239
FAX 509-773-6206



**EXEMPTION FROM SHORELINE
MANAGEMENT ACT SUBSTANTIAL
DEVELOPMENT PERMIT REQUIREMENT**

TO: Andrew L. Kallinen (Columbia Hills State Park)
POB 426
Dallesport, WA 98617

The proposal is to remove indigo bush along the western shore of Horsethief Lake, from approximately 25 feet upland down to the high water mark. The proposed project location is the shoreline of Horsethief Lake, in the NE SW ¼ of Section 19, Township 2 North, Range 14 E., W.M. This proposal is a permitted use within the Conservancy Environment and is exempt from the requirement of a substantial development permit because:

- The Conservancy Environment provides that clearing by hand held equipment of invasive non-native shoreline vegetation or plants listed on the State Noxious Weed List is permitted in shoreline locations if native vegetation, or other species recommended by the Natural Resource Conservation District, is promptly re-established in the disturbed area.
- The total cost of the project is projected to be \$4,000. Any development of which the total cost or fair market value, whichever is higher, does not exceed five thousand dollars, if such development does not materially interfere with the normal public use of the water or shorelines of the state is exempt from requirement of a substantial development permit.

The proposed development is consistent with:

CONSISTENT INCONSISTENT

The WA State Shoreline Management Act
The Klickitat County Shorelines Master Plan

10/1/04

DATE

A handwritten signature in black ink that reads "Curt Dreyer".

Curt Dreyer, Planning Director

ajohnson006.max

Source: WA Department of Ecology, 2005.

Figure H-4. Exemption letter #4

KLICKITAT COUNTY PLANNING DEPARTMENT

228 W. Main Street, MS: CH-17
Goldendale, WA 98620

509-773-5703
1 800 765-7239
FAX 509-773-6206



**EXEMPTION FROM SHORELINE
MANAGEMENT ACT SUBSTANTIAL
DEVELOPMENT PERMIT REQUIREMENT**

TO: USDA Forest Service Columbia Gorge National Scenic Area
902 Wasco Ave, Suite 200
Hood River, OR 97031
Attention: Sue Baker

The site of the proposal is the White Salmon River, just north of the Hwy 141 bridge over the White Salmon near Husum, within a portion of the SW ¼ of Section 30, Township 4 North, Range 11 East, W.M. The proposal is to stabilize the West side portage by installing three terrace/steps and re-vegetating upstream and downstream banks and to provide areas of stable footing on the East side portage route by anchoring fat-topped rocks with cable and leveling off others. This proposal is associated with recreational use of the White Salmon River. It is a permitted use within the Community Environment and is exempt from the requirement of a substantial development permit because:

- The proposed activities constitute normal maintenance and repair of an existing use that has been damaged by natural elements. The proposed activities will lessen erosion and restore natural vegetation.
- The total cost of the project is projected to be \$4,000. Any development of which the total cost or fair market value, whichever is higher, does not exceed five thousand dollars, if such development does not materially interfere with the normal public use of the water or shorelines of the state is exempt from requirement of a substantial development permit.

The proposed development is consistent with:

CONSISTENT INCONSISTENT

The WA State Shoreline Management Act
The Klickitat County Shorelines Master Plan

10/4/04

DATE

Curt Dreyer, Planning Director

ajohnson006.max

Source: WA Department of Ecology, 2005.

Figure H-5. Exemption letter #5



KLICKITAT COUNTY PLANNING DEPARTMENT
228 W. Main Street, MS: CH-17
Goldendale, WA 98620

509-773-5703
1 800 765-7239
FAX 509-773-6206

**EXEMPTION FROM SHORELINE
MANAGEMENT ACT SUBSTANTIAL
DEVELOPMENT PERMIT REQUIREMENT**

TO: WA State Parks and Recreation Commission
P.O. Box 42650
Olympia, WA 98504-2650
ATTN: Erin Curl, WCC Environmental Specialist

The proposal by WA State Parks and Recreation Commission to maintain a swim beach area for public recreational use. The activity will be approximately 50 feet above the Ordinary High Water Mark (OHWM), where unwanted vegetation grows. The sand that has been brought to the surface will be moved down to the OHWM. No new sand is added or removed from the swim beach area. The maintenance will take place when the water level is low. No motorized equipment will be operated within the wetted perimeter. The proposal is located on the Columbia River in Section 4, T2N, R16E, W.M. The proposal is a permitted use in the Community Environment and is exempt from the requirement of a substantial development permit because:

- Normal maintenance or repair of existing shoreline stabilization and food protection works and emergency construction necessary to protect property from damage by the elements. "Normal maintenance" includes those usual acts to prevent a decline, lapse, or cessation from a lawfully established condition. "Normal repair" means to restore a development to a state comparable to its original condition within a reasonable period after decay or partial destruction except where repair involves total replacement which is not common practice or causes substantial adverse effects to the shoreline resource or environment; exemptions as outlined in WAC 173-14-040(b).
- The total cost of the project is \$300.00. Any development of which the total cost or fair market value, whichever is higher, does not exceed five thousand dollars, if such development does not materially interfere with the normal public use of the water or shorelines of the state is exempt from requirement of a substantial development permit.

The proposed development is consistent or inconsistent with:

CONSISTENT INCONSISTENT

The WA State Shoreline Management Act
The Klickitat County Shorelines Master Plan

10-18-04

DATE:

Curt Dreyer, Planning Director

ajohnson006.max

Source: WA Department of Ecology, 2005.

Figure H-6. Exemption letter #6



**KLICKITAT COUNTY
PLANNING DEPARTMENT**

226 W. Main St., MG: CH-17, Goldendale, Washington 98020
VOICE: 509 773-5703 or 1 800 765-7239
FAX: 509 773-6206



**EXEMPTION FROM SHORLINE
MANAGEMENT ACT SUBSTANTIAL
DEVELOPMENT PERMIT REQUIREMENTS**

To: Earl Prentice
U.S. National Marine Fisheries Service
P.O. Box 130
Manchester, Wa 98353

Legal
Description: SW ¼ of Section 30, Township 4N, Range 11E,
Government Lot 3

Project: Fish counting equipment to detect fish that have been
tagged

Exemption
Section: Page 79 of the Klickitat County Shoreline Master Plan
provides exemption for "A public or private project, the
primary purpose of which is to improve fish or wildlife
habitat or fish passage"

The proposal as described above and in the JARPA application is consistent with the policies of the Shoreline Management Act and Klickitat County Shoreline Master Plan. An exemption from the requirement of a Substantial Development Permit requirement is hereby granted, with the following conditions:

Source: WA Department of Ecology, 2005.

Appendix I

Road Analysis

This appendix includes findings of the road analysis presented in Chapter 5.

Table I-1. Total road length per road type for each reach in the 50-foot buffer

Reach	Road Type			Total (mi.)
	Highway	Paved	Gravel/Dirt	
Lyle	0.02	0.00	0.00	0.02
Lower Klickitat	2.92	0.02	1.79	4.73
Klickitat	0.00	0.00	0.36	0.36
Upper Klickitat	0.83	2.84	1.07	4.74
Little Klickitat	0.04	0.04	0.14	0.22
Total (mi.)	3.81	2.90	3.35	10.07

Source: USGS DOQ photographs, 1996; WSDOT DOQ photographs, 2002; CPW, 2005.

Table I-2. Total road length per road type for each reach in the 50-100-foot buffer

Reach	Road Type			Total (mi.)
	Highway	Paved	Gravel/Dirt	
Lyle	0.02	0.00	0.00	0.02
Lower Klickitat	2.15	0.02	3.22	5.38
Klickitat	0.33	0.00	0.34	0.68
Upper Klickitat	1.39	2.81	0.69	4.89
Little Klickitat	0.23	0.04	0.35	0.62
Total (mi.)	4.12	2.87	4.60	11.59

Source: USGS DOQ photographs, 1996; WSDOT DOQ photographs, 2002; CPW, 2005.

Table I-3. Total road length per road type for each reach in the 100-200-foot buffer

Reach	Road Type			Total (mi.)
	Highway	Paved	Gravel/Dirt	
1 - Lyle	0.10	0.00	0.30	0.41
2 - Lower Klickitat	1.78	0.05	2.63	4.45
3 - Klickitat	0.66	0.00	1.10	1.76
4 - Upper Klickitat	2.18	2.24	2.02	6.44
5 - Little Klickitat	0.20	0.17	0.87	1.24
Total (mi.)	4.92	2.46	6.92	14.29

Source: USGS DOQ photographs, 1996; WSDOT DOQ photographs, 2002; CPW, 2005.

Table I-4. Total impact area per road type for each reach within the 200-foot buffer

Reach	Road Type			Total (acres)
	Highway	Paved	Gravel/Dirt	
1 - Lyle	0.89	0.00	0.76	1.64
2 - Lower Klickitat	42.72	0.53	19.06	62.30
3 - Klickitat	6.20	0.00	4.51	10.71
4 - Upper Klickitat	27.50	49.24	9.43	86.18
5 - Little Klickitat	2.93	1.61	3.37	7.92
Total (acres)	80.24	51.38	37.13	168.75

Source: USGS DOQ photographs, 1996; WSDOT DOQ photographs, 2002; CPW, 2005.

Appendix J

Wetland Analysis

The U.S. Fish and Wildlife Service (USFW) National Wetlands Inventory identifies wetlands by type along the Klickitat and Little Klickitat Rivers. The USFW defines wetlands as “lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water.” Wetlands must have one or more of the following attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is non soil and is saturated with water or covered by shallow water at some time during the growing season of the year.⁴¹

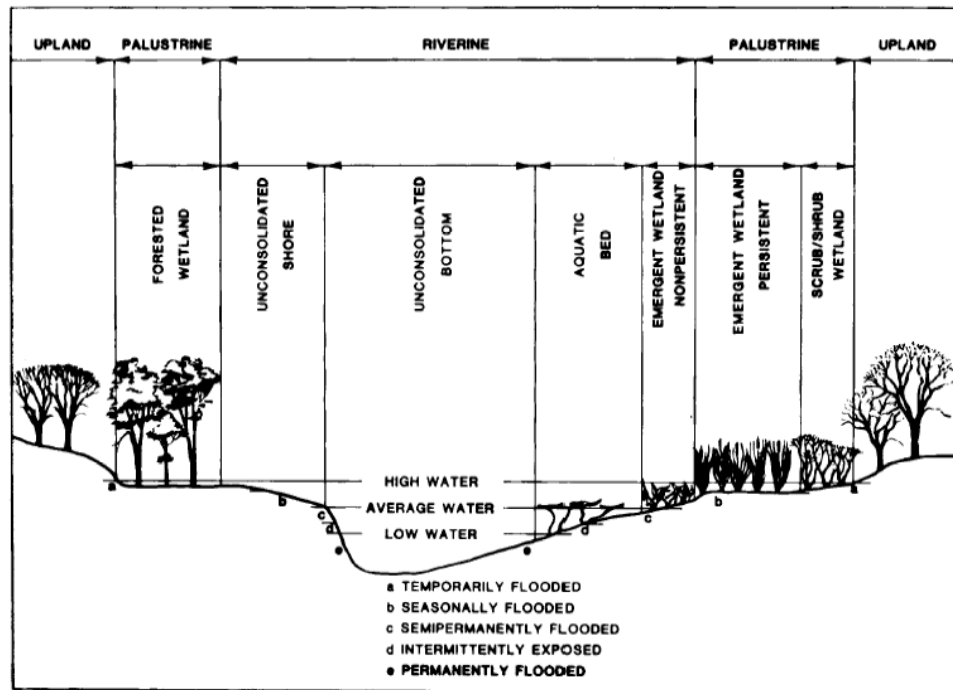
The U.S.F.W National Wetlands Inventory created the geospatial data for this analysis, including wetland maps, in 1980-1989.⁴² There are five types of wetlands along the Klickitat and Little Klickitat Rivers (Figure J-1):

- Freshwater Emergent
- Freshwater Forested Shrub Wetland
- Riverine
- Lake
- Other

⁴¹ U.S.F.W National Wetlands Mapper, accessed online at U.S.F.W. website: wetlands.fws.gov/definition.htm

⁴² U.S.F.W National Wetlands Mapper, accessed online at U.S.F.W. website: wetlands.fws.gov/mapper_tool.htm

Figure J-1. Distinguishing features and examples of habitats in the riverine system



Source: Classification of Wetland and Deep Water Habitat of the U.S., U.S. Department of the Interior, 1979.