

## Chapter 3: Analysis of Major Issues

### 3.1 INTRODUCTION

This chapter analyzes major surface water management issues in Jefferson County. It addresses existing conditions and projected future conditions resulting from population growth and development. The projected conditions are based on the goals, policies, and land use designations in the Jefferson County Comprehensive Plan and the development regulations in the Jefferson County Unified Development Code. They are also based on the County's adopted population projections and projections of rural population growth, based on the distribution of residential building permits issued from 1998-2003.

The analysis in this chapter briefly summarizes issues that are discussed in more detail in other documents, including in the County's Comprehensive Plan and accompanying State Environmental Policy Act (SEPA) documents, the watershed planning Technical Assessments prepared for Water Resource Inventory Area (WRIA) 16 Skokomish-Dosewallips and WRIA 17 Quilcene-Snow Creek, and the Washington Department of Ecology *Stormwater Management Manual for Western Washington*.

### 3.2 EFFECTS OF RURAL RESOURCE ACTIVITIES

The information presented in Chapter 2 documents Jefferson County's predominantly rural character. The Technical Assessments compiled for WRIA 16 and 17 indicate that many of Eastern Jefferson County's existing surface water management problems are related to rural resource land uses: forest management and agriculture.

#### Forest Management

Jefferson County's high percentage of forest cover is a primary factor responsible for the generally high quality of the County's surface water resources. Precipitation falling on a forested environment in western Washington generates very little surface runoff, even during heavy storms. It is intercepted by foliage and evaporates; it is taken up by trees and other plants; it flows through shallow soil layers; and it infiltrates into groundwater. This pattern protects rivers and streams from runoff even during large storm events and maintains stable stream channels, water quality, and healthy aquatic environments.

Recent research cited in the *Stormwater Management Manual* indicates that these healthy surface water conditions are found in watersheds where forest cover is greater than 65% and impervious surface does not exceed 5%. These conditions occur not only in protected forest areas such as the Olympic National Park and Olympic National Forest wilderness areas and in managed forestlands of the Olympic National Forest and on State and private forestlands; they also occur on a significant portion of Jefferson County that is designated rural residential and is forested.

Forest management activities have, however, also impacted surface waters in Jefferson County. The loss of forest cover, particularly in riparian areas and on steep and unstable slopes, and the effects of road construction can result in higher runoff volumes and peak flows, increased water temperature; increased landslides, erosion, sedimentation, and turbidity; decreased amount of large woody debris in streams and rivers; and decreased channel stability. These effects have degraded fish habitat.

In balance, properly managed forestlands have significantly fewer adverse impacts on surface water resources than typically result from the higher levels of land clearing, impervious surface, and polluted runoff that occur from residential and commercial development.

### **Agriculture**

Agriculture in Jefferson County occurs primarily in the lowland valleys of Chimacum, Donovan, Leland, Salmon, Snow, and Tarboo Creeks and the Little and Big Quilcene and Dosewallips Rivers.

Agricultural lands have very low levels of runoff-producing impervious surface compared to areas with residential and commercial development. However, when agricultural lands are located adjacent to rivers and streams, they can result in significant surface water impacts unless they are properly managed.

Agricultural activities have impacted surface waters in Jefferson County through draining and cultivating wetlands, channelizing streams, removing riparian vegetation, allowing livestock direct access into streams, and introducing reed canary grass. These activities were conducted to improve agricultural production, but they have resulted in fecal coliform contamination; bank erosion; increased turbidity, nutrient loading, and water temperature; reduced dissolved oxygen; and loss of stream channel diversity. These effects have degraded fish and shellfish habitat.

Jefferson County is addressing this issue by developing Agriculture and Fish & Wildlife Habitat Protection Plans for the County's watersheds that identify voluntary measures to protect and restore fish habitat and that are also compatible with maintaining the viability of the County's agricultural economy. The first of these plans was developed for the Chimacum Creek watershed. A second plan for the remaining County watersheds will be developed by 2006.

### **Recommendation**

Properly managed forestlands and agricultural lands have significantly fewer impacts on surface water resources than residential and commercial development. Therefore, preserving rural resource lands and ensuring that they are properly managed is consistent with protecting surface waters.

Jefferson County's strategy to protect surface water resources in rural resource areas should continue to include the following components:

- Maintain the existing Comprehensive Plan forestlands and agricultural lands designations. Proposed Comprehensive Plan amendments to revise forestlands and agricultural lands designations should include an analysis of surface water impacts, including potential loss of forest cover, and proposed mitigation measures.
- Develop and implement Agriculture and Fish & Wildlife Habitat Protection Plans for County watersheds that establish voluntary measures to protect and restore fish habitat that are also compatible with maintaining existing agriculture.
- Designate appropriate agricultural zoning and allow appropriate agricultural accessory uses to ensure adequate economic returns from agricultural lands that avoid pressure to convert to residential use.
- Provide technical assistance to rural landowners to assist them in making appropriate economic use of their land and to implement best management practices that protect and restore surface water resources.

- Support fish habitat restoration efforts by the Jefferson County Conservation District, Washington Department of Fish and Wildlife, tribes, and regional salmon enhancement groups.

### 3.3 EFFECTS OF RURAL RESIDENTIAL DEVELOPMENT

Jefferson County's adopted 2024 population projections estimate that 30% of the County-wide population growth (4,149 new residents) will occur in designated rural residential and resource areas. In 2024 18,121 residents (45% of the County population) will live in rural and resource areas. Table 2-2 shows the projected distribution of this population growth by watersheds. It is based on the distribution of building permits for new single-family residential construction in rural areas for 1998-2003. It indicates that low rural population densities will continue.

Typically, rural residential development in Jefferson County has occurred on land that has been converted from a forested condition. When forested land is converted to residential development, there is potential for changes in stream hydrology (increased runoff and peak storm flows and decreased summer base flows) and stream channel configuration (down cutting, sediment transport, loss of bank vegetation, and channel instability) and degradation of aquatic habitat (decreased numbers and diversity of both vertebrates and invertebrates). These effects occur when impervious surfaces such as roads, parking lots, and buildings are constructed. They also occur to a lesser, but still potentially significant extent, when forests are converted to pervious areas such as pasture or lawn.

Increased runoff transports sediment and other pollutants into streams and other water bodies during storms. Higher peak flows during storms down cut streambeds, erode riparian vegetation, and degrade gravel that salmon require for spawning. Increased impervious surface and runoff also decreases infiltration and groundwater recharge. This decreases groundwater that provides summer stream flows. The loss of forest cover also results in warmer water that has lower levels of dissolved oxygen. These affects are detrimental to aquatic organisms, particularly salmon and trout populations.

Since impervious surface is typically low on 5-20 acre rural residential development parcels, the extent of forest cover is the critical variable affecting the health of surface water resources in areas being developed for rural residential use. Recent research discussed in the *Stormwater Management Manual for Western Washington* (Volume I, Page 1-17) strongly suggests that in typical rural residential development settings, if greater than 65% forest cover is maintained and stream and wetland buffers are preserved, it is reasonable to expect that surface water resources can be protected. Considering the extent of forest cover in the Olympic National Park and Forest, on State forestlands, and on designated private forestland, it is likely that 65% forest cover can be maintained in most of Jefferson County's watersheds, provided that there is not excessive loss of forest cover on designated rural residential lands.

There are two general strategies that Jefferson County could implement to ensure that adequate forest cover is preserved in County watersheds. First, Jefferson County could conduct a public education program that conveys to rural residential landowners the importance of forest cover for protecting surface water resources. This approach assumes that a significant proportion of informed rural residents would appreciate the importance of aquatic systems and would choose to maintain sufficient forest cover on their land that the County's goal could be achieved. Second, Jefferson

County could adopt regulations that limit clearing in watersheds where forest cover is projected to decline below 65%.

Jefferson County should implement the first option. Considering the extent of designated forestland and the extent of existing forest cover on rural residential lands, it seems reasonable that a serious public education effort by Jefferson County can achieve the goal of preserving adequate forest cover. The second strategy is not recommended for several reasons. It does not appear to be necessary at this time and would have significant administration and enforcement costs. Most importantly, a regulatory strategy risks alienating people who would otherwise support the goal of preserving forest cover and protecting surface water resources. An emphasis on public education is a more effective means to create public support for surface water management goals.

Forest cover may decline below 65% in the lower reaches of some more-developed watersheds. This has the potential to impact surface waters resources, for example, summer chum salmon habitat on Chimacum Creek. The Hood Canal Coordinating Council is developing a Summer Chum Recovery Plan that will include specific recommendations for restoring summer chum.

In addition to issues related to forest cover and impervious surface, many County residents raise horses and other livestock on a small scale. Mud and manure from these livestock operations has the potential to degrade surface water resources. These effects can be avoided by implementing best management practices. Organizations such as the Conservation District and 4-H can provide technical assistance to small livestock operations to enable them to achieve this goal.

### ***Recommendation***

Jefferson County's strategy to protect surface water resources in rural residential areas should include the following components:

- Maintain the existing Comprehensive Plan rural residential densities. Proposed Comprehensive Plan amendments to revise rural residential densities should include an analysis of surface water impacts, including potential loss of forest cover, and proposed mitigation measures.
- Encourage clustered rural residential developments (PRRDs) in order to preserve large forested tracts and minimize impervious surfaces required for access roads.
- Continue to require buffers around rivers, streams, and wetlands based on best available science.
- Conduct public education activities to convey the value of forest cover for protecting surface water resources.
- Provide technical assistance to rural residential landowners to assist them to implement best management practices for small livestock operations.
- Monitor the percentage of forest cover at regular intervals corresponding to required Comprehensive Plan updates.
- Implement the recommendations of the Summer Chum Recovery Plan developed by the Hood Canal Coordinating Council.
- Make appropriate revisions to the Surface Water Management Program, County Comprehensive Plan, and Unified Development Code as necessary to maintain forest cover on rural resource lands that is adequate to protect surface water resources.

### **3.4 EFFECTS OF RURAL COMMERCIAL DEVELOPMENT**

The location and intensity of commercial development in rural areas is limited by Jefferson County's Comprehensive Plan designations and Unified Development Code regulations. This, in turn, limits

the amount of impervious surface and stormwater runoff that will be generated by rural commercial development. The boundaries of Jefferson County's rural commercial areas were delineated based on development and infrastructure existing in 1990. The location and size of Jefferson County's rural commercial areas is discussed in Chapter 2. They were not sized to accommodate a specific level of development that was projected to occur during the planning period. It is reasonable to expect that some of the rural commercial areas will not be built out during the planning period.

While there may be localized surface water impacts from rural commercial development that require appropriate stormwater management facilities, rural commercial development in Jefferson County has not had and is not anticipated to have surface water impacts at the watershed level.

### ***Recommendation***

The focus of Jefferson County's strategy to protect surface water resources from impacts related to rural commercial development should be to retain the existing Comprehensive Plan limits on rural commercial designations and the Unified Development Code's setback and stormwater management requirements. If additional land is proposed for rural commercial designation, potential surface water impacts should be considered during the redesignation process.

## **3.5 URBAN STORMWATER MANAGEMENT**

Urban areas have a significantly greater extent of impervious surfaces such as roads, parking lots, and roofs than rural areas. Urban areas also have significant areas of lawns and other landscaping. These urban characteristics produce significantly greater volumes of stormwater runoff than rural areas. This can result in significant changes to the natural hydrology including increased frequency and duration of high stream flows during storm events that can down cut stream channels, transport sediment, disrupt spawning gravel, erode stream banks, decrease infiltration and groundwater recharge, and decrease summer stream flows.

As stormwater flows across impervious surfaces, lawns, and landscaping, it can become contaminated with oil and grease, heavy metals, fertilizers, pesticides, herbicides, bacteria, viruses, and sediment. This is commonly referred to as non-point pollution. Stormwater can transport these pollutants to surface water bodies and groundwater.

These factors can significantly degrade the water quality, diversity, and productivity of aquatic environments. They can also result in flooding and damage to public and private property. Urban development therefore requires implementation of a stormwater management program.

The Port Hadlock Urban Growth Area is characterized by urban development. As urban development in the UGA extends and intensifies, it will be necessary to ensure that there are adequate urban stormwater management facilities and programs to protect surface water and groundwater resources.

### **Urban Stormwater Management Facilities and Programs**

Urban stormwater management requires development of stormwater management facilities to collect, convey, treat, detain, discharge, and infiltrate stormwater runoff. Typically, developers provide these facilities for their development projects and State and local governments provide them for public facilities, particularly roads. In areas where these facilities were not provided or where the existing facilities were not appropriately designed or are in need to repair, it may be necessary to form a utility local improvement district to fund the construction of stormwater management facilities.

Capital facility planning to plan for, design, construct, maintain, and finance urban stormwater management facilities is an important component of urban stormwater management.

Urban stormwater management also requires non-structural program components, including inspection and maintenance of stormwater management facilities, public education and outreach, and water quality monitoring.

### **Urban Stormwater Management Components**

There are three main components of urban stormwater management:

- **Construction Stormwater Pollution Prevention:** Controlling sediment, other pollutants, and runoff during construction activities;
- **Flow Control:** Controlling stormwater runoff from impervious surfaces such as roads, parking lots, and roofs and from lawns and landscaped areas that are not impervious, but still significantly impede infiltration of water; and
- **Water Quality Protection:** Preventing stormwater from coming into contact with pollutants (source control) and providing adequate treatment for contaminated stormwater runoff.

### **Construction Stormwater Pollution Prevention (CSWPP) Plans**

Construction stormwater pollution prevention plans focus on planning, designing, and implementing best management practices to avoid impacts during development. The *Stormwater Management Manual* lists the following 12 elements of construction stormwater pollution prevention:

- Marking clearing limits,
- Establishing a stabilized construction access,
- Controlling runoff,
- Implementing sediment controls,
- Stabilizing exposed soils,
- Protecting slopes from erosion,
- Protecting drain inlets from sediment,
- Stabilizing temporary conveyance channels,
- Controlling pollutants on site by covering and containment and by appropriate fueling and maintenance practices,
- Controlling discharge from dewatering trenches,
- Inspecting and maintaining best management practices, and
- Project management: phasing construction stages, seasonal work limitations, monitoring Best Management Practices (BMPs), and modifying the CSWPP Plan as appropriate.

### **Flow Control**

The purpose of flow control is to avoid impacts to downstream properties, conveyance systems, stream channels, and wetlands from stormwater runoff. This can be achieved through:

- **Detention systems** that store runoff in ponds and vaults and discharge it at a rate that mimics natural conditions;
- **Infiltration systems** that store runoff in ponds and vaults and discharge it into the soil and groundwater; and
- **On-site stormwater management** that uses decentralized BMPs to retain, infiltrate, and disperse runoff on-site to reduce the disruption of the natural hydrology.

On-site stormwater management uses site design, preserving on-site soils and vegetation, amending soils, dispersing and infiltrating runoff, and features such as rain gardens, porous pavers, and pervious pavements. Site design includes defining development envelopes and protected areas, minimizing directly connected impervious areas, maximizing site permeability, and constructing narrower streets. These and other on-site stormwater management BMPs are referred to as **Low Impact Development (LID)**. LID is discussed in greater detail in Section 3.7.

#### ***Water Quality Protection: Pollutant Source Control and Runoff Treatment***

Water quality protection involves both **source control** (keeping pollutants out of stormwater) and **runoff treatment** (removing pollutants from runoff). Source control measures are typically simpler and less expensive than runoff treatment facilities. Once stormwater comes in contact with pollutants, it can be technically challenging and expensive to treat it. Therefore, stormwater management systems should place a priority on source control measures. There are two types of source control measures. **Structural source control** focuses on covering and containing pollutants. **Operational source control** focuses on good housekeeping, employee training, spill prevention and cleanup procedures, regular inspections, and record keeping.

Runoff treatment uses a variety of physical, biological, and chemical means to remove pollutants from stormwater. Common examples are wet ponds, oil-water separators, biofiltration swales, and sand filters. These facilities can be expensive to construct and maintain. It therefore makes sense to employ source control measures to the greatest extent feasible.

#### **Stormwater Management Facility Inspection, Maintenance, and Repair**

In order to ensure that stormwater management facilities continue to function properly, they need to be inspected and maintained. This requires having operational plans for the facilities, establishing and funding an inspection system, and establishing legal and financial mechanisms that obligate facility owners to conduct inspections and perform maintenance and repairs. Jefferson County currently requires developers to enter into an agreement with the County that they will maintain the stormwater management facilities that serve their developments. While Jefferson County does not, at this time, have a program to inspect stormwater management facilities or to verify that the owner is maintaining them, this is still a valuable tool that can be the basis for an inspection program in the future.

It should also be noted that many of the stormwater management facilities in the County were developed recently. There are no documented problems related to failure of these systems.

#### **Urban Road Standards**

Most of the roads in the Port Hadlock UGA are constructed to a rural stormwater management standard. They use ditches to collect, convey, treat, and discharge stormwater runoff. There are also dry wells and infiltration trenches at a few locations. Because much of the UGA has porous soils that easily infiltrate runoff and because there is a minimal potential for polluted stormwater runoff from low volume roads, managing stormwater runoff from roads has not been a major issue in the area. However, as the UGA develops, roads will need sidewalks with curb and gutter and stormwater management facilities. Currently, the only area in the UGA that has these facilities is in the area around the Port Hadlock intersection. Providing these facilities is the responsibility of the County Public Works Department. Funding these facilities will be the joint responsibility of UGA property owners and Jefferson County.

### **Funding for Stormwater Management Facilities**

While private developers construct most stormwater management facilities to serve their developments, there is also the need to construct or retrofit regional facilities. The State Legislature has authorized several revenue sources to fund development and maintenance of stormwater management facilities. These include forming utility local improvement districts and charging a stormwater control fee as authorized by RCW 36.89 and creating a sewer district to construct storm sewers as authorized by RCW 36.94. Another option that has been used in Port Ludlow is the formation of a Drainage District (RCW 85.06). These mechanisms for developing and funding surface water and stormwater management facilities are discussed in greater detail in Chapter 5 Policy and Regulation and Chapter 7 Revenue.

### **Stormwater Management for the Port Hadlock Urban Growth Area**

Jefferson County has developed a Port Hadlock UGA Stormwater Management Plan that:

- Analyzes existing surface water and stormwater conditions,
- Projects future conditions based on projected development in 2024,
- Proposes constructing stormwater management facilities and conducting stormwater management program activities to avoid significant impacts to surface waters and groundwater from stormwater runoff,
- Proposes UGA stormwater management goals and policies, and
- Provides planning level cost and revenue analysis for providing stormwater management facilities and programs.

The UGA occupies approximately 20% of the lower Chimacum Creek watershed. The drainage analysis conducted for the UGA Stormwater Plan indicates that there are currently no significant stormwater runoff impacts to Chimacum Creek from development in the UGA. The analysis also demonstrates that urban development can occur without significant impacts to the Creek from stormwater runoff. Achieving this goal will require developing adequate stormwater management facilities and implementing a UGA Stormwater Management Program that includes:

- Inspection of private stormwater management facilities to ensure that they are adequately maintained, repaired, and replaced,
- Updating the inventory of stormwater management facilities in the UGA,
- Public education and outreach activities,
- Water quality monitoring on Chimacum Creek, and
- Stream gauging on Chimacum Creek.

Public education and outreach activities are intended to increase public understanding of stormwater management issues, generate support for protecting surface water resources, and increase compliance with stormwater management regulations. These activities are described in detail in UGA Stormwater Management Plan.

Water quality monitoring and stream gauging will enable the Jefferson County to determine if stormwater management measures are successful. If there is significant water quality degradation or increased storm flows in Chimacum Creek, these activities will alert the County and enable it to adapt its stormwater management measures appropriately to address the problem.

The UGA Stormwater Management Plan proposes to fund stormwater management facilities and programs with a stormwater control fee authorized by RCW 36.89. Funding for urban stormwater management is discussed in Chapter 7.

### **Stormwater Management for the Port Ludlow Master Planned Resort**

The Port Ludlow Master Planned Resort has limited areas with development densities that are urban in character, primarily the resort and commercial areas. The Port Ludlow Drainage District has developed and is implementing a Comprehensive Drainage District Stormwater Management Plan for the District's jurisdiction in northern portion of the MPR. This area includes the areas that have urban characteristics. It is anticipated that in the future, the District will expand to serve the southern part of the Port Ludlow MPR.

### ***Recommendation***

Jefferson County's strategy to protect surface water resources from the impacts of urban stormwater runoff should include the following components:

- Limit areas affected by urban stormwater runoff by maintaining the County Comprehensive Plan's limits on commercial development and intensive residential development in rural areas;
- Amend the Unified Development Code as necessary to encourage low impact development practices;
- Implement the recommendations of the Port Hadlock UGA Stormwater Management Plan, including inspecting stormwater management facilities, conducting public education activities and water quality monitoring, and maintaining stream gauges.
- Implement the recommendations of the Summer Chum Recovery Plan prepared by the Hood Canal Coordinating Council.
- Consider new sources of revenue to fund urban stormwater management activities, including stormwater control fees.

### **3.6 SURFACE WATER AND GROUNDWATER**

The discussion of the hydrologic cycle in Chapter 1 shows that the relationship between surface waters and groundwater is a fundamental surface water management consideration. Investigating this relationship and determining the availability of surface waters and groundwater for beneficial uses is a major component of Washington State's watershed planning process.

Surface water recharges groundwater and, therefore, surface water quality and quantity affect groundwater quality and quantity. Groundwater provides drinking water for many County residents. Groundwater aquifers also store water that is discharged to rivers and streams. Surface water withdrawals can reduce the amount of water available to recharge ground waters. Extensive areas of impervious surface (e.g., roads, parking lots, and roofs) can cause precipitation to run off, instead of infiltrating into groundwater. Contaminated surface waters, particularly stormwater runoff, can contaminate groundwater. In short, the quantity and quality of groundwater, stream flow levels, and fish and wildlife habitat are all affected by surface water management activities.

Groundwater also affects surface waters. Groundwater is discharged to rivers and streams. This is a principle component of summer stream flows, particularly in east Jefferson County where summers are comparatively dry. Groundwater withdrawals can therefore adversely affect stream flow. This affect is mitigated in rural areas because a large portion of domestic water used in rural areas is discharged into on-site septic systems that recharge shallow aquifers that discharge to streams.

While the relationship between surface water and groundwater is fairly straightforward in principle, determining the precise nature of the connection between surface waters and groundwater in a particular watershed requires compiling and analyzing complex hydro-geologic data. This is particularly true in areas like Jefferson County that have a complex geology resulting from repeated glaciations. There is disagreement among stakeholders involved with watershed planning for WRIA 17 regarding the adequacy of hydro-geologic data and analysis to accurately characterize the connectivity of surface waters and groundwater

The related issues of surface water and groundwater management have been considered through the watershed planning process for WRIA 17. There is broad consensus that water is not available in WRIA 17 streams for additional year-round surface water withdrawals. There is disagreement, however, regarding the degree of connectivity between surface waters and groundwater and the effect of groundwater withdrawals on surface waters. Because of this disagreement, the WRIA 17 planning unit members did not reach consensus on setting instream flows.

The Washington Department of Ecology is developing rules (Draft WAC 173-571) to set minimum instream flows for WRIA 17 watersheds. The rules would close all WRIA 17 streams to additional year-round surface water withdrawals. Seasonal withdrawals would be permitted on the Big Quilcene River and Chimacum Creek. The rules would also limit additional groundwater withdrawals.

There is disagreement regarding the adequacy of the data and the validity of the assumptions and modelling available to establish the proposed instream flows for WRIA 17. These disagreements fall into three categories.

First, there is disagreement regarding the adequacy of hydro-geologic data and analysis to accurately characterize the connectivity of surface waters and groundwater.

Second, there is also disagreement related to stream flow modeling. It appears that stream models are based on assumptions about stream flows that would not occur under typical rainfall conditions in eastern Jefferson County. The proposed instream flows in the Thorndyke Creek illustrates this issue. Thorndyke Creek has very low groundwater and surface water withdrawals. The proposed instream flows exceed the highest actual flows (the 10% exceedence level) during the period from April through October. This means that the proposed instream flow is higher than would typically occur in the stream under most natural conditions.

Finally, there is disagreement regarding recharge from on-site septic systems into shallow aquifers. The reserves are based in part on the assumption 50% recharge. Studies by the US Geological Survey indicate that the recharge rate is about 75%.

Beyond these technical issues, there is concern that there should be a reserve available for domestic and agricultural use. Jefferson County has recognized that the Growth Management Act's goal of preserving rural character requires more than simply restricting residential and commercial development in rural areas. It also means adopting policies and implementing programs that support rural communities and the agricultural economy. Jefferson County has endeavored to do this by designating Agricultural Lands of Local Significance in the Comprehensive Plan and by amending the Unified Development Code to allow a wide variety of agricultural accessory uses on these lands.

These efforts will be in vain, however, if there is not adequate water for agricultural production, particularly emerging agricultural activities.

In November 2005 Jefferson County adopted a policy statement committing the County to implementing recommendations of the WRIA 17 Plan. It also expresses both procedural and substantive concerns regarding the Department of Ecology's proposal for setting in-stream flows, particularly the failure to allocate groundwater for agriculture. The policy states that Jefferson County supports developing a comprehensive water management strategy that protects salmon, ensures water supply, and supports local food production through an agricultural trust water right or other measures that would make available new, reserved, conserved, or transferred water sources.

The effect of surface water closures and limited groundwater reserves could be somewhat offset by increasing the availability of water through water right purchases and transfers and by the creation of additional storage capacity. The Jefferson County Public Utility District has taken the lead in addressing these issues.

### ***Recommendation***

Jefferson County should continue to work with WRIA 16 and 17 stakeholders and the Department of Ecology to set instream flows and groundwater reserves for domestic and agricultural use that are based on adequate geo-hydrologic data and appropriate models and that protect fish populations. The County should also work with WRIA 16 and 17 stakeholders to identify other measures such as storage and water conservation to ensure that water is available for rural domestic use and agricultural production.

Note: At the time that the draft of this chapter was written, the Department of Ecology had withdrawn a draft proposal for instream flows and groundwater reserves. Ecology has announced its intention to revise its approach to setting instream flows in WRIA 17. The process and timeframe for adopting an instream flow rule is unclear. This section will be revised as appropriate prior to final Plan adoption.

### **3.7 LOW IMPACT DEVELOPMENT**

Low Impact Development (LID) is an alternative stormwater management strategy that emphasizes site design, minimizing impervious surface, preserving natural vegetation, enhancing on-site soils, and using small-scale infiltration systems to maintain natural hydrologic functions on development sites. Maintaining infiltration and groundwater recharge are important LID goals. The LID process involves:

- Mapping a development site's natural features: drainage, soils, vegetation, topography, and sensitive areas;
- Identifying areas on the site to be developed and areas to be preserved;
- Minimizing impervious surface by techniques such as designing narrower roads and clustering development areas;
- Preserving site vegetation and soils;
- Dispersing stormwater into naturally vegetated areas to promote infiltration;
- Directing stormwater into small landscaped areas (bioretention cells or rain gardens) to infiltrate it;
- Reducing impervious surface by using permeable pavers and pavement for parking lots, driveways, and walkways; and

- Amending soils with compost to improve infiltration and plant growth.

For information on Low Impact Development go to <http://www.psat.wa.gov/Programs/LID.htm>

### ***Recommendation***

Jefferson County should implement the following strategies to support low impact development:

- The County's development regulations should encourage implementing LID practices.
- The County should provide information about LID to developers, homebuilders, and homeowners. This could be achieved by providing brochures and other information at the Jefferson County Permit Center and by sponsoring workshops and other public outreach activities.
- As opportunities occur, the County should conduct or support LID demonstration projects such as using pervious pavement for parking facilities and constructing rain gardens. These activities could be implemented at County facilities and other public facilities such as schools and the County Library.

### **3.8 FLOOD HAZARD MANAGEMENT**

Jefferson County's climate, topography, and geology and the tendency for people to settle on developable land in flood plain areas make flood hazard management an important component of surface water management. Flood hazard management encompasses several activities including:

- Mapping flood plains,
- Studying flood plain hydrology, channel migration, and natural resources,
- Creating flood management districts to promote citizen involvement in decision-making,
- Developing and implementing floodplain management policies and regulations,
- Developing flood hazard management plans,
- Designing and constructing flood hazard mitigation projects,
- Purchasing flood-prone properties, and
- Implementing the National Flood Insurance Program's Community Rating System.

Jefferson County has been active in all of these activities, except for the last. As with other aspects of surface water management Jefferson County has done a good job of reacting to emerging flood management problems. These activities are discussed in Chapter 4 Surface Water Management Activities. As the County develops a Surface Water Management Program, the most important flood hazard management issue in Jefferson County is the need to develop a comprehensive flood hazard management program to provide planning, establish priorities, coordinate with other agencies, and identify stable revenue sources. This will enable the County to pursue its flood management goals more effectively.

Much of Jefferson County's focus has been on the Big and Little Quilcene River flood plains. The County should continue to implement flood hazard mitigation projects identified for these areas. In addition the County should develop and implement comprehensive flood hazard management plans for the Dosewallips and Duckabush Rivers.

Jefferson County could reduce flood insurance premiums for flood plain property owners by participating in the National Flood Insurance Program's (NFIP) Community Rating System (CRS). This is a voluntary incentive program that discounts flood insurance premium rates to reflect the reduced flood risk resulting from the community floodplain management activities that exceed the

minimum NFIP requirements. These activities must meet the three goals of the CRS: (1) reduce flood losses; (2) facilitate accurate insurance rating; and (3) promote the awareness of flood insurance. Flood insurance premium rates can be discounted up to 45% for participating communities. The CRS classifies local communities based on 18 activities, organized under four categories: (i) Public Information, (ii) Mapping and Regulations, (iii) Flood Damage Reduction, and (iv) Flood Preparedness.

In order to develop an effective Flood Hazard Management Program, Jefferson County must identify stable and equitable revenue sources that will be supported by the community. Revenue sources for flood hazard management activities are discussed in Chapter 7. These include grants from the State and Federal governments. These grants typically require local matching funds. These can include flood zone assessments paid by flood plain property owners. In order to give an incentive to flood plain landowners to support assessments, the County should participate in the CRS program so that landowners receive lower flood insurance premiums.

### ***Recommendation***

Jefferson County's flood hazard management strategy should include the following components:

- Develop a Flood Hazard Management Program as a component of a Surface Water Management Program;
- Continue to implement flood hazard mitigation activities identified for the Big and Little Quilcene River floodplains;
- Develop Dosewallips and Duckabush River Comprehensive Flood Hazard Mitigation Plans;
- Reduce flood insurance rates by participating in the National Flood Insurance Program Community Rating System; and
- Develop revenue sources for planning and implementing a Flood Hazard Management Program.

### **3.9 SALMON AND TROUT RECOVERY**

Jefferson County's surface waters provide habitat for numerous salmon and trout stocks. Many of these stocks have been reduced to critical levels and three have been listed under the Federal Endangered Species Act: Hood Canal summer chum salmon, Puget Sound chinook salmon, and bull trout.

Restoring salmon and trout populations is focused on four areas:

- Conducting studies that provide a clearer understanding of habitat requirements and identify effective recovery strategies and projects;
- Developing land use policies and development regulations that protect fish habitat;
- Restoring degraded fish habitat; and
- Removing fish passage barriers, primarily road culverts that block access to habitat.

Numerous Federal and State agencies, local governments, tribes, private organizations, and individuals are involved in recovery efforts. These activities are proceeding not only because of legal requirements, but also because Jefferson County's citizens and government place a very high value on salmon and trout and the natural environment that they inhabit. There is not a particular County department that is responsible for Jefferson County's recovery activities. The Community Development and Public Works Departments and Natural Resources Division have had responsibility for various aspects of these activities. Salmon and trout recovery activities are discussed in more detail in Chapter 4.

### ***Recommendation***

Jefferson County should coordinate its participation in salmon recovery activities through a Surface Water Management Program.

### **3.10 SHELLFISH PROTECTION**

Commercial, recreational, and tribal shellfish harvesting is an important activity in Jefferson County that relies on clean water. Contamination from failing on-site septic systems, livestock, stormwater runoff, marinas and vessels, and seals can result in the closure of shellfish beds. This has occurred in Quilcene Bay. Jefferson County led an effort that corrected this problem and reopened the area for shellfish harvest.

Jefferson County will continue to play an important role in protecting shellfish resources. It has the authority to:

- Regulate the design, construction, and operation of on-site septic systems and to require oversight and repair;
- Assist homeowners to repair failing systems that could degrade water quality;
- Regulate stormwater runoff from development.

The Jefferson County Conservation District provides technical assistance to farmers and livestock managers regarding livestock and nutrient management and WSU Extension has expertise regarding public education to prevent water quality degradation from marinas and vessels.

### ***Recommendation***

On-site septic system permitting and repair should remain as components of the Jefferson County Environmental Health Department's programs. However, the Surface Water management Program should provide funding to the Environmental Health Department to manage the Department's on-site septic system database. The Conservation District's agricultural technical assistance program and a boater education program conducted by WSU should be components of a Jefferson County Surface Water Management Program.

### **3.11 MARINAS AND BOAT LAUNCHES**

Chapter 2 includes a list of Jefferson County's numerous marinas and boat launches. These facilities are potential sources of water quality degradation, including spills of oil, gasoline, diesel, and other hazardous materials and illegal sewage disposal from vessels.

The most effective way to avoid these impacts is by providing outreach to boaters, particularly through marina operators and boater organizations. WSU Extension has expertise regarding public education to prevent water quality degradation from marinas and vessels.

### ***Recommendation***

A boater education program conducted by WSU Cooperative Extension should be a component of a Jefferson County Surface Water Management Program.

### **3.12 MARINE SHORELINE HABITAT PROTECTION**

Marine waters are a component of the County's surface waters. Recently there has been a focus on the importance of marine shorelines and near-shore areas for salmon habitat. Out-migrating juvenile

salmon use the near-shore area to feed and avoid predation. Important salmon prey species such as surf smelt and sand lance spawn in higher intertidal areas. Shoreline development, stormwater runoff, and construction of bulkheads can impact intertidal and near-shore areas.

The Jefferson County Shoreline Management Master Program (SMP) is both a planning tool and a regulatory document that addresses development and uses in and adjacent to waters of the State, including marine waters. The State of Washington requires Jefferson County to revise its SMP. Jefferson County has received funding from the State to assist it to revise its SMP

***Recommendation***

Surface water management issues related to the marine shoreline jurisdiction should be addressed through the SMP revision. Actions to protect marine waters that are identified in the revision could be included in a Surface Water Management Program.