

## **CHAPTER NINE - NATURAL ENVIRONMENT**

### **I. INTRODUCTION**

The natural environment is among Thurston County's most important assets. It performs many functions that sustain and enrich us, such as providing recreational opportunities, a vital source of potable water, economic opportunities, and habitat for fish and wildlife. A variety of land uses, from agriculture, forestry, and mining to residential and commercial developments, both impact and are influenced by the natural environment. The challenge for the county is to adopt and implement regulations and programs that accommodate these land uses while protecting, enhancing and conserving the quality of its natural environment.

The Growth Management Act and the County-wide Planning Policies it mandates provide direction to help the county meet this challenge. The Growth Management Act calls for protecting the environment and enhancing the state's high quality of life, including air and water quality, and the availability of water (Planning Goal 10). The Act also requires the development of regulations, based on best available science, to protect critical environmental resources and avoid natural hazards. These "Critical Areas" include, but are not limited to, aquifer recharge areas (where water infiltrates to aquifers), geologic hazard areas (such as steep slopes prone to landslides), important wildlife habitats and species, frequently flooded areas (such as floodplains and surfacing groundwater), and wetlands.

County-wide Planning Policies 9.1 through 9.8 call for all jurisdictions in the county to recognize their dependence on natural systems and maintain a balance between human uses and the natural environment, protect ground and surface water from degradation, protect and enhance air quality, minimize high noise levels, promote awareness of cultural and natural heritage, encourage recycling of materials and products and reduction of waste, and to plan for growth in a manner that can be sustained without degrading the county's livability and environmental quality.

This Natural Environment Chapter, together with other chapters of the Comprehensive Plan, establishes a framework of goals, objectives, and policies that indicate how the county will protect its natural beauty and environmental quality while minimizing the impacts of natural hazards, consistent with state law and the County-wide Planning Policies.

### **II. BACKGROUND**

#### **A. ENVIRONMENTAL FEATURES**

Thurston County has a rich diversity of terrain and natural features. The county contains approximately 128 miles of marine shoreline along four peninsulas jutting into Puget Sound. This shoreline includes high bluffs, beaches, spits, points, barrier berms, and a

delta at the mouth of the Nisqually River. The central portion of the county consists mainly of prairies with remnant stands of Oregon white oak and conifers that are bounded by the Black Hills to the west and the Cascade foothills to the southeast. Other notable natural features in the county include expansive floodplains; the Mima Mounds; important fish and wildlife habitats; and McAllister Springs, a major public drinking water source.

Many of the county's natural features perform vital environmental functions that are sensitive to human impacts or pose hazards to life and property. For example, wetlands store and cleanse stormwater, thereby mitigating flooding and improving water quality. They also provide important wildlife habitat. These functions are easily destroyed or degraded by development and other activities. The steep slopes and unstable soils that occupy about thirteen percent of the county are subject to erosion, slippage, or settling in the event of earthquakes, rain saturation, or improper building practices.

The county's diverse terrain and habitat types support a wide variety of fish, birds, mammals, amphibians and other wildlife, including state and federally protected species. For example, the Nisqually Wildlife Refuge supports over 300 species of wildlife.

The county's air quality is generally good due to climate, physiography, and the limited number of particulate producing industries.

## **B. WATER RESOURCES**

The Growth Management Act requires the county to: "Provide for protection of groundwater quality and quantity, and provide guidance for corrective actions to mitigate or cleanse those discharges entering Puget Sound or other waters of the State."

The county's water resources include four marine inlets (Budd, Eld, Henderson, and Totten) and the Nisqually Reach, all of which support shellfish beds, anadromous fish and a variety of other marine life and birds. The county also contains 108 lakes totaling approximately 6,343 acres. Alder Lake, a 1,117-acre reservoir on the Nisqually River, is the largest of the county's lakes. Black Lake, which spans 576 acres, is the county's largest natural lake.

In addition, the county contains several rivers and numerous small streams, many of which support anadromous and resident fish. Most of Thurston County is located within three major drainage basins. The largest drains the southwest portion of the county through the Black, Skookumchuck, and Chehalis rivers, which eventually flow to the Pacific Ocean. The Deschutes River drains the central portion of the county before flowing through Capitol Lake to Puget Sound. The Nisqually River drains a narrow area along the county's eastern boundary enroute to the Nisqually Reach of Puget Sound. Several small streams, including Woodland, Kennedy, Woodard, Green Cove, Perry and McLane creeks, flow directly to Puget Sound.

Wetlands comprise nearly ten percent of the county and, as previously mentioned, perform the important functions of cleansing and slowly releasing stormwater, thereby improving water quality and moderating stream flows.

Most Thurston County residents rely on groundwater for their drinking water. Except for minor surface withdrawals, groundwater also provides all of the water used by industry and agriculture. In addition, during the dry season, groundwater sustains stream flows and dependent fish, aquatic life, and other wildlife.

Nearly all of the groundwater in Thurston County starts as rain that falls within the county. For the most part, the county's soils, even sloping and clay-rich soils, allow rainfall to infiltrate into the local aquifers (i.e., layers of subsurface material with voids where the groundwater collects.) However, various parts of the county have very different aquifers. The northern and southeastern portions of Thurston County generally are underlain by four major aquifers stacked on top of each other with clay-rich confining layers between them. McAllister and Allison springs flow from these aquifers and serve as major water sources for the north county public water system. Much of southwestern Thurston County is underlain by a single shallow aquifer with no confining layers, making it susceptible to contamination.

Aquifers in the vicinity of the Black Hills, Bald Hills, the Maytown uplands near Tenino, and Michigan Hill in the southwestern portion of the county are not reliable sources of potable water. Also, in some places, small ponds and streams are dry for significant portions of the year due to lowering of the groundwater levels in the upper aquifer. The Deschutes River, Chehalis River, Yelm Creek, and Scatter Creek are all influenced to some degree by groundwater withdrawals. Projected population growth may require additional groundwater withdrawals to serve new residents. Care must be taken to ensure that these withdrawals do not result in reduced summer stream flows or elevated water temperatures that jeopardize the survival of fish or other aquatic life.

Groundwater in the county is of generally high quality, with some exceptions. Scattered leaks and spills of fuels and solvents have contaminated small areas of some aquifers. Also, in several areas, wells have been contaminated by pesticides or nitrates, forcing their abandonment. A few areas in the county have nitrate levels that are significantly above background levels.

The county participated in multi-jurisdictional watershed planning for the four Water Resource Inventory Areas that encompass the county's major watersheds. The plans address water quantity and quality issues, including instream flow and aquatic habitat protection. These plans provide a greater understanding of each watershed and will help the county and other jurisdictions, tribes, and agencies to prudently manage our water resources.

### C. NATURAL HAZARDS

The forces of nature periodically ravage the county. Approximately 41.7 square miles of the county (about seven percent of the unincorporated area) lie within 100-year floodplains (areas with a 1 in 100 chance of being flooded each year). Winter storms in 1996 and early 1997 produced flooding that destroyed more than two dozen homes in the county and inundated approximately 200 others, contaminated about 200 wells, caused numerous septic system failures, and closed 300 road segments. More than 1,000 people evacuated their homes. Losses totaled in excess of forty million dollars. In 1999, Thurston County adopted the Thurston County Flood Hazard Management Plan to establish countywide management strategies to minimize the risks to life and property from flooding. In 2000, the county enrolled in the Community Rating System (CRS) through the National Flood Insurance Program. The CRS provides a framework for flood hazard mitigation and other activities to reduce the county's risk of flood damage. The county's current rating (2003) is Class 5, one of the highest ratings for a county in the nation. This rating enables residents and property owners within the unincorporated county to receive a twenty-five percent reduction in flood insurance rates.

During wet winters, surfacing groundwater inundates substantial portions of the county, particularly in the Salmon Creek Basin south of the City of Tumwater. The county has adopted regulations to regulate development in proximity to these flood hazard areas to avoid property damage and groundwater contamination.

Saturated soils, particularly in areas where groundwater is perched above a shallow till layer, also pose problems for development in portions of the north county and contribute to slope failure in some instances. Projected population increases will likely lead to infiltration of additional rainwater into the soils as the evapo-transpiration capacity of forests is reduced by development. Care must be taken to ensure that new development does not worsen groundwater flooding or increase the potential of landslides.

Mount Rainier, which graces much of the county's skyline, poses the risk of a volcanic eruption. In past centuries, lahar flows composed of mud, rock and trees have spewed from the mountain and buried the lower elevation areas along the entire length of the Nisqually River. If future flows breach Alder Dam on the Nisqually River, the impact could be devastating.

Steep slopes and bluffs pose risk of landslides, especially where springs or stormwater undermine their stability. Areas with significant potential for landslides include marine bluffs, steep slopes and bluffs along streams, and steep slopes in Black Hills and Bald Hills. Maps of landslide hazard areas are available online through the county's GeoData Center.

Earthquakes have caused significant damage in Thurston County. In 2001, the county was shaken violently by a 6.8 earthquake centered near the mouth of the Nisqually

River. While most of the county escaped with only minor damage, development on poorly consolidated fill and soils subject to liquefaction were severely damaged. In 2003, Thurston Regional Planning Council worked with the county's jurisdictions to prepare the "Natural Hazards Mitigation Plan for the Thurston Region." This plan provides a coordinated approach for addressing the natural hazards occurring in the county.

#### **D. IMPORTANT GREENSPACES**

The Growth Management Act requires that the Comprehensive Plan identify "open space corridors within and between urban areas." These open space corridors are to include "lands useful for recreation, wildlife habitats, trails, and connection of critical areas." Planning Goal 9 of the Act states "Encourage the retention of open space and development of recreational opportunities, conserve fish and wildlife habitat, increase access to natural resource lands and water, and develop parks."

In addition, the County-wide Planning Policies call for the county to: "Maintain significant wildlife habitat and corridors" and "provide for parks and open spaces."

The Important Greenspaces Map (M-31) in this plan, identifies areas important for recreation, water quality protection, trails, open space and resource use (i.e., long term forestry and agriculture) within and adjacent to the county.

The Comprehensive Parks, Recreation, Trails and Natural Resource Preserve Plan 2020, adopted separately from the Comprehensive Plan, provides a coordinated approach for park and trail development, natural resource preservation, and provision of recreation services. It calls for completion of a regional, interconnected trail and open space system that spans the north county urban growth areas and extends through rural areas to provide links to south county communities.

As of October 2002, the Thurston County Parks and Recreation Department manages 2,773 acres, including 42.5 miles of regional trails (23 miles of which are open for public use as of 2003), expansive natural areas within parks, and several natural area preserves. The preserves include Indian Road Park (5 acres), Woodland Creek Wetlands Preserve (75 acres), Lake Lawrence Park (15 acres), Black River-Mima Prairie Glacial Heritage Preserve (1,020 acres), Johnson Point Wetlands Preserve (26 acres), and the Black River Natural Area (13 acres). Appendix 1 of the Comprehensive Parks, Recreation, Trails and Natural Resource Preserve Plan 2020 contains a complete list of the county's parks and open space along with a description of their characteristics and facilities.

In addition to county parks and open spaces, state and federal agencies manage approximately 49,714 acres in the county comprised of state parks, natural area preserves, such as the Woodard Bay Natural Resource Conservation Area on Henderson Inlet, many recreational sites within the state's Capitol Forest, the state and federal Nisqually Wildlife Refuge, the Black River Wildlife Refuge, and other wildlife

habitat mitigation and management sites. The state also owns or operates several boat ramps in the county. In addition, private groups have purchased land and easements to preserve important natural areas in the county (see Map 31).

The Comprehensive Parks, Recreation, Trails and Natural Resource Preserve Plan 2020 identifies county residents' priorities for additional parks, recreation facilities, trails, greenways, and natural resource preservation. The community strongly supports development and acquisition of multiple use trails and greenways, water access sites, natural resource preserves, picnic sites, athletic fields and other active recreation facilities. The plan establishes a strategy for accommodating these community desires.

### III. GOALS, OBJECTIVES AND POLICIES

#### A. GEOLOGIC HAZARD AREAS

**GOAL:** MINIMIZE THE LOSS OF LIFE AND PROPERTY FROM LANDSLIDES AND SEISMIC, VOLCANIC, OR OTHER NATURALLY OCCURRING EVENTS, AND MINIMIZE OR ELIMINATE LAND USE IMPACTS ON GEOLOGICALLY HAZARDOUS AREAS.

**OBJECTIVE:** To designate and manage geologic hazard areas to avoid loss of life and damage to structures by guiding development away from geologic hazard areas and by regulating uses and activities that occur within or near such areas in a manner that minimizes the potential for damage or loss of life.

**POLICIES:**

1. The county should designate and provide for the protection and management of geologic hazard areas based on best available science and cumulative impact assessments of existing and planned land and resource uses within and near geologic hazard areas.
2. The county should restrict development and resource use within or near areas susceptible to significant damage from erosion, landslides, earthquakes or lahar flows, as necessary to protect life, property, and wildlife habitats (e.g., streams and marine waters downslope).
3. The county should cooperate with other jurisdictions and agencies to implement the “Natural Hazards Mitigation Plan for the Thurston Region,” TRPC 2003, or as hereafter amended.
4. The county should protect the public from natural hazards, minimize the need for emergency rescues and replacement of public facilities damaged by natural forces, and avoid public subsidy of private development located in areas vulnerable to damage from natural events by minimizing the amount of development at risk.
5. The county should delineate landslide hazards, the path of potential lahar flows, and other natural hazard areas with the greatest degree of accuracy possible. Reevaluate land use regulations in light of the refined mapping and make changes as warranted, consistent with public safety and best available science.
6. The county should collaborate with other jurisdictions and agencies to gain a better understanding of earthquake hazards in the county and devise appropriate mitigative measures to minimize the loss of life and property.

**ACTION NEEDS:**

1. Review and amend as necessary the geologic hazard areas section of the Critical Area regulations at least every five years to reflect best available science,

relevant new information, the results of project monitoring and evaluation, and cumulative impact assessments of existing and planned future land and resource uses within and near geologic hazard areas.

2. Update maps depicting liquefaction susceptibility and create a map identifying areas with strong ground motion with the greatest level of accuracy possible.
3. Evaluate areas of groundwater flooding, unstable soils, and steep slopes to identify areas where additional infiltrated stormwater might intensify known flooding and landslide hazards.
4. Evaluate potential earthquake damage in the county using HAZUS software or other appropriate computer model.
5. Evaluate critical county-owned facilities to identify their vulnerability to seismic events.
6. Develop a public outreach program to provide information related to earthquake preparedness.

## **B. GROUNDWATER AND AQUIFER RECHARGE AREAS**

**GOAL:** PROTECT Groundwater QUALITY AND QUANTITY.

**OBJECTIVE:** To provide for the identification and protection of sensitive aquifer recharge areas, protect groundwater quality, and prudently conserve groundwater resources.

### **POLICIES:**

1. The county should designate and provide for the protection and management of groundwater and aquifer recharge areas based on best available science and cumulative impact assessments of existing and planned future land and resource uses within and near aquifer recharge areas.
2. The county should protect groundwater quality and prevent aquifer contamination, degradation, and depletion through the comprehensive management of groundwater in conformance with the Clean Water Act, the Northern Thurston County Ground Water Management Plan, the South Thurston County Aquifer Protection Strategy, and all other applicable federal, state and local water quality regulations.
3. The county should determine, based on watershed plans, if there are areas where low summer stream flows or elevated instream water temperature may, now or in the future, imperil anadromous or native resident fish. If such areas are identified, the county should devise and implement development restrictions and management practices as necessary to sustain the fish.

4. The county should reduce allowed land use densities, in areas where the supply of groundwater is limited, to the extent necessary to preserve sufficient water for existing uses, unless alternative domestic water supplies are available from other sources. Special consideration should be given to areas where additional groundwater withdrawals would diminish summer stream flows and elevate instream water temperatures and thereby jeopardize the survival of anadromous or native resident fish.
5. The county should regulate land uses within designated wellhead protection areas to prevent degradation of groundwater quality.
6. The county should strive to develop and fully implement regional wellhead protection policies and locally developed wellhead protection plans. Support efforts by water utilities to acquire or provide long-term management of wellhead protection areas.
7. The county should encourage that coordinated, reliable water systems be used to provide water in the urban growth areas. Urge jurisdictions to develop compatible, coordinated water system design standards for their growth areas.
8. The county should discourage construction and use of individual private wells in urban growth areas where community or public water sources are reasonably and economically available.
9. The county should encourage the use of community or public water in unsewered areas where residential density is in excess of one unit per acre. Community or public water systems should also be provided in residential developments with densities in excess of one unit per two acres and excessive soil permeability.
10. The county should ensure that community and public water systems and supplies are managed to meet state and local health standards.
11. The county should regularly monitor and protect the water quality of watersheds feeding into water bodies used for drinking water (e.g., Summit Lake). If pollution is identified, the county should devise and implement programs to improve water quality.
12. The county should encourage the safe recycling and reuse of water and treated wastewater in order to recharge aquifers, conserve groundwater supplies, and reduce contamination of receiving waters.
13. The county should encourage the use of no- and low-water use appliances and fixtures, particularly in conjunction with septic systems, to reduce the potential for groundwater contamination.
14. The county should promote the use of integrated pest management and the reduction of pesticide and fertilizer use by residents, businesses, and

governmental agencies in designated wellhead protection areas and in areas identified as a source of contamination to important wildlife habitats and shellfish beds.

The county should develop a strategy for conserving water in periods of drought that includes public education and notification.

**ACTION NEEDS:**

1. Review and amend as necessary the aquifer recharge areas section of the Critical Area regulations at least every five years to reflect best available science, relevant new information, the results of project monitoring and evaluation, and cumulative impact assessments of current and planned land and resource uses within and near aquifer recharge areas.
2. Work with municipal water purveyors to secure a long-term funding source to provide water resource protection services for the entire county.
3. Work with municipal water purveyors to monitor water quality in aquifers in order to assess long-term trends, and identify and respond to water quality problems. Encourage data sharing with other jurisdictions, agencies, and water purveyors. Seek funding to support these efforts.
4. Review the extent and nature of well siting problems and adopt solutions. This includes evaluating and addressing potential cumulative threats to instream flow posed by wells that do not require acquisition of State water rights.
5. Support development of Watershed Plans and Total Maximum Daily Load programs to address groundwater quality and quantity, as well as instream flow protection and elevated instream water temperature.
6. Review the urban water supply service area plan and give consideration to the development of a regional water source and distribution system. The plan should examine 50+ year supply issues and be funded through inter-jurisdictional agreements.
7. Identify areas critical to the protection of drinking water supplies and measures needed to assure their protection.
8. Make literature available to residents that compare the efficiency of low-water use fixtures to conventional fixtures.
9. Make private water purveyors aware of the adopted Coordinated Water System Plans for the Urban Growth Areas in North and South Thurston County.
10. Examine opportunities for developing a rural-area Coordinated Water System Plan or other water service policy framework to provide for improved reliability and prudent management of water resources.

11. Provide technical assistance and education, to the extent resources allow, to small businesses, industries, and residents in designated wellhead protection areas regarding proper storage, handling and disposal of hazardous materials.
12. Participate, as resources allow, in planning and training for regional spill response in designated wellhead protection areas.
13. Incorporate methods to mitigate the risk from commercial hazardous materials transportation through designated wellhead protection areas when planning new transportation corridors.
14. Provide, as resources allow, local information to the existing data management program within the Department of Ecology to develop and maintain an underground storage tank database for commercial underground storage tanks.
15. Coordinate environmental review with other jurisdictions when evaluating development proposals within designated wellhead protection areas.
16. Address domestic drinking water supply as part of land use planning.
17. Incorporate requirements for enhanced protection of wellhead protection areas in the stormwater drainage manual and development regulations.
18. Work with other jurisdictions to coordinate educational programs to provide a basic wellhead protection message and deliver the message to community groups and private parties whenever possible.
19. Encourage the Thurston Conservation District Board to continue their voluntary efforts regarding education, conservation planning, and installation of best management practices on existing farms, golf courses, parks, schools, residences, and other facilities which use pesticides and fertilizers in designated wellhead protection areas.

To extent that resources permit, the county should implement the relevant portions of adopted Watershed Plans prepared in accordance with RCW 90.82.

### **C. SURFACE WATER**

**GOAL:** PROTECT AND IMPROVE THE WATER QUALITY AND BIOLOGICAL HEALTH OF LAKES, WETLANDS, RIVERS, STREAMS, AND PUGET SOUND.

**OBJECTIVE 1:** To manage surface water in a manner that will protect or improve the quality of water sustaining human use, wildlife, and aquatic life.

**POLICIES:**

1. The county should provide for the protection and management of surface water, consistent with the Clean Water Act, based on best available science and

- cumulative impact assessments of existing and planned future land and resource uses within the watersheds.
2. The county should retain substantially in their natural condition: ponds, wetlands, rivers, lakes and streams, and their associated buffers and riparian areas.
  3. The county should protect streams from the adverse impacts of activities occurring within their watersheds to avoid degradation of their water quality and biological health. These impacts include, but are not limit to, elevation of stream water temperature and low flows in summer and stream channel damage and sedimentation from excessive flows during winter.
  4. The county should protect and maintain the valuable natural functions of wetlands by maintaining an undisturbed or restored native vegetation buffer around the wetland and by prohibiting filling, draining, and clearing within wetlands and their associated buffers.
  5. The county should designate and protect riparian habitat areas to help maintain water quality consistent with best available science. (Also see related policies under Section E, Important Fish, Wildlife, and Plant Habitat).
  6. The county should prevent development and activities in streams, riparian areas, and wetlands and any associated buffers that would damage water quality or habitat functions, except to the minimum extent necessary when there is no reasonable alternative for accommodating an essential use (e.g., an essential road or utility crossing).
  7. The county should consider establishing a wetland mitigation bank to provide an alternative to individual stream and wetland mitigation projects associated with essential public projects. Enhancement of degraded wetlands is preferred over creation of new wetlands.
  8. The county should require, to the extent legally permissible, restoration of degraded buffers and wetlands associated with lakes, streams, rivers, and Puget Sound as a part of new land uses and development activity.
  9. The county should cooperate with adjoining jurisdictions to develop complementary regulations pertaining to streams, upland wildlife habitat, and other Critical Areas that span jurisdictional boundaries.
  10. The county should evaluate the performance of county regulations in maintaining surface water and monitor the performance of restoration and enhancement projects to provide a basis for periodic refinement of county regulations and management practices.
  11. The county should promote the use of integrated pest management, reduction of pesticide and fertilizer use, and best management practices for animal waste by

residents, businesses, and governmental agencies in areas identified as a source of contamination of surface water, particularly if it affects the harvest of shellfish.

12. The county should provide technical assistance and education, to the extent resources allow, to operators of small businesses and industrial uses, and residents located near surface water bodies regarding proper storage, handling and disposal of hazardous materials.
13. The county should encourage the Thurston Conservation District Board to continue their voluntary efforts regarding education, conservation planning, and use of best management practices on existing farms, golf courses, parks, schools, residences, and other facilities that use pesticides and fertilizers near surface water bodies.

**ACTION NEEDS:**

1. Review and amend as necessary the sections of Critical Area regulations relevant to surface water at least every five years to reflect best available science, relevant new information, the results of project monitoring and evaluation, and cumulative impact assessments within the watersheds.
2. Develop or endorse stream and wetland restoration guidelines, consistent with best available science, which serve to improve water quality and habitat values, while providing for some economic use of the land.
3. Regularly update wetland and stream maps with the greatest degree of accuracy possible.
4. Support development of Watershed Plans and Total Maximum Daily Load programs to address instream flow protection, water temperature problems, and water quality.

Educate landowners regarding the importance of protecting natural vegetation in riparian habitat areas and wetland buffers.

**OBJECTIVE 2: *Lake Management*** - To provide for a comprehensive, long-term approach to lake management that accommodates all appropriate uses and benefits, consistent with the maintenance or enhancement of water quality.

**POLICIES:**

1. The county should work with property owners and interested parties to develop an integrated aquatic management plan for lakes, consistent with best available science and the Clean Water Act, that addresses pollution sources, such as stormwater runoff and on-site disposal system effluent, and the cumulative impacts of existing and planned future land and resource uses within the watersheds.

2. The county should strive to reduce the spread of Eurasian milfoil and other exotic aquatic weeds through monitoring, public information and other means.

**OBJECTIVE 3:** *Marine Waters and Shoreline Management* - To preserve and protect marine shorelines and near shore areas as valuable natural resources and habitats, consistent with state and federal law.

**POLICIES:**

1. The county should regulate uses and activities along the marine shoreline and within the waters of Puget Sound, consistent with the State Shoreline Management Act and the Clean Water Act, based on best available science and cumulative impact assessments of existing and planned future land and resource uses in upland watersheds.
2. The county should identify and protect, consistent with best available science, important, sensitive marine habitats, such as juvenile salmon migration corridors, kelp and eelgrass beds, shellfish beds, and herring and smelt spawning areas.
3. The county should protect special shoreline features, such as dry accretion beaches, and undeveloped bays and lagoons.
4. The county should provide information to property owners regarding various protection options for their marine shoreline consistent with the State Shoreline Management Act and the Shoreline Master Program for the Thurston Region. Encourage the use of “bioengineered” shoreline stabilization as an alternative to bulkheading or other forms of shoreline armoring where necessary to protect existing structures from erosion.

**ACTION NEED:**

1. Update the Shoreline Master Program consistent with state law, and integrate it into the Comprehensive Plan and the development regulations to facilitate coordination and administration.

**D. FREQUENTLY FLOODED AREAS**

**GOAL:** protect life and structures from flood hazards and retain the flood storage, transmission capacity, and habitat value of floodplains.

**OBJECTIVE:** To provide the highest degree of flood protection at the least cost.

**POLICIES:**

1. The county should provide the highest degree of flood protection at the least cost through identification and accommodation of natural flooding and channel migration processes that pose hazards to life or property. Protection and management should be based on best available science and cumulative impact assessments of existing and planned future land and resource uses within the floodplains, channel migration zones, and watersheds.

2. The county should prohibit development and emplacement of fill in floodways and floodplains, except to the minimum extent necessary to accommodate public infrastructure and utilities that cannot be accommodated elsewhere and to stabilize channels against erosion in order to protect existing agricultural lands, public roads and bridges, public infrastructure, utilities and significant private structures, and to achieve habitat enhancement. Any development in the floodways should be designed to avoid habitat degradation. Stream bank stabilization, if necessary, should be of a type that maintains or enhances habitat functions. Rip-rap and other hard armoring should only be used if there is no effective alternative, based on sound engineering principles, to protect existing structures or public facilities.
3. The county should provide for land uses such as forestry, open space, public recreation, existing agriculture and water-dependent uses in areas subject to river flooding to minimize risks to life and structures and help retain or enhance habitat functions. Other uses and development in the floodplain should be restricted to minimize public safety risks (e.g., through compensating design features) and loss of habitat function.
4. The county should minimize disruption of long-term stream channel migration processes that allow formation of essential habitat features by prohibiting construction of new structures in channel migration zones and minimizing streambank stabilization.
5. The county should actively participate in the multi-jurisdictional flood hazard reduction efforts within the Chehalis River Basin.
6. The county should regulate uses in and around areas where groundwater periodically surfaces as necessary to avoid property damage and protect groundwater quality.
7. The county should maintain the county's enrollment in the Community Rating System through the National Flood Insurance Program.

**ACTION NEEDS:**

1. Review and amend as necessary the frequently flooded areas section of the Critical Area regulations at least every five years to reflect best available science, relevant new information, the results of project monitoring and evaluation, and cumulative impact assessments of current and planned future land and resource uses within and near frequently flooded areas.
2. Map floodways, floodplains, channel migration zones and areas subject to high groundwater flooding with the greatest degree of accuracy possible.
3. Install and maintain flood elevation poles and gauges along major rivers and within designated groundwater flood hazard areas.

4. Create maps depicting projected flood inundation from possible failure of the Skookumchuck Dam on the Skookumchuck River and the Alder and La Grande dams on the Nisqually River.
5. Develop management programs to avoid or minimize flooding risks for existing and future land uses. This could include a range of measures including regulation and compensation for the removal of structures subject to frequent flooding.
6. Prioritize properties in the floodplain to purchase in the event federal money becomes available for that purpose.
7. Prioritize residences in the 100-year floodplain that the county would help elevate if state or federal monies become available for that purpose.
8. Identify structures and properties subject to repeated flooding that are not already listed by FEMA.

#### **E. IMPORTANT FISH, WILDLIFE, AND PLANT HABITAT**

**GOAL:** PROTECT, CONSERVE, AND ENHANCE THE ECOLOGICAL FUNCTIONS OF IMPORTANT FISH, WILDLIFE, AND PLANT HABITATS.

**OBJECTIVE:** Identify important fish, wildlife, and plant habitats and develop strategies for protecting or restoring important habitats, particularly if they are at risk of significant degradation.

#### **POLICIES:**

1. The county should protect fish and wildlife habitats that are important to the long-term viability of locally important species in Thurston County, which are unique or rare, or which contain state priority species or species listed under the federal Endangered Species Act.
2. The county should identify and protect (e.g., through easements, fee acquisition, or regulations) land providing essential connections between riparian habitat areas, open spaces, and significant wildlife habitats sustaining state priority, federally listed, or locally important wildlife species. Include wildlife corridors that lead away from riparian areas to facilitate wildlife migration to upland habitats and minimize the potential for increased fecal contamination of streams from wildlife sources.
3. The county should encourage protection of areas containing special plants and special plant communities listed by the state Department of Natural Resources Heritage Program.
4. The county should establish and protect riparian habitat areas to maintain or enhance the functions sustaining aquatic life and terrestrial wildlife, consistent with best available science.

5. The county should establish priorities for performing stream/subwatershed assessments to tailor and refine riparian habitat widths, consistent with best available science, to provide appropriate water quality and habitat protection while minimizing the burden on affected property owners. Priority should be given to those areas at greatest risk of degradation, for example, due to potential impacts from existing and planned development, the sensitivity of dependent species, or the sensitivity of the watershed's hydrology to development.
6. The county should evaluate streams/riparian areas supporting anadromous fish, sensitive native resident fish, or state priority wildlife species to determine their long-term viability to sustain such fish and wildlife at buildout of the drainage basin under current regulations, consistent with best available science. The county should build upon the information and analysis produced through the Watershed Resource Inventory Area projects as necessary to assess current and projected stream and riparian conditions. In performing the assessments, consider factors such as stream gradient, channel dimensions, valley configurations, historical conditions, current stream conditions, the width, continuity and quality of riparian areas, the presence of any associated wetlands, aquatic and terrestrial habitat utilization and sensitivity, the intensity of adjacent uses, current zoning, the cumulative impacts of existing and planned future land and resource use, subwatershed hydrology (e.g., based on soil characteristics, tree cover, land use types and characteristics, impervious surface coverage, and the performance of existing stormwater facilities), and water quality.

If any streams/riparian areas that currently support anadromous fish, sensitive native resident fish, or state priority wildlife species would not be expected to sustain such fish and wildlife at buildout of the subwatershed under current zoning and development regulations, the county should identify and pursue viable remedial actions to preserve or enhance the habitat functions (e.g., maintaining water quality). Remedial actions may include, for example, limits on effective impervious surface coverage and retention of substantial tree cover in the subwatershed, higher stormwater standards, reduced housing density, limits on stream crossings by roads or utility lines to maintain the continuity of riparian areas, expanded riparian areas, and restoration.

7. The county should identify priorities for fish and wildlife habitat protection/acquisition and other remedial actions necessary to maintain or restore the riparian or important upland habitat. Consider giving highest priority for habitat protection/acquisition to the following:
  - a. streams/riparian areas with sensitive fish or wildlife species in watersheds with existing or planned levels of development that threaten fish and wildlife survival;
  - b. streams/riparian areas that support significant numbers of anadromous or sensitive native resident fish in drainages with moderate levels of development which,

based on best available science, have potential to be maintained or restored if prompt action is taken;

c. streams/riparian areas largely in a natural condition that support the county's largest or most sensitive populations of Chinook, coho or chum salmon, steelhead, cutthroat trout or other native fish, particularly if they are listed as endangered or threatened species; and

d. streams/riparian areas that support sensitive populations of priority wildlife species or significantly affect shellfish beds subject to harvest restrictions or closures.

8. The county should provide for removal of existing "man made" barriers to anadromous fish migration in streams (e.g., impassible culverts) and prohibit installation of new barriers.

9. The county should preserve adequate water quantity and quality for fish migration, spawning, incubation and rearing, including peak and summer flow levels, dissolved oxygen and chemical content, sediment load, and temperature.

10. The county should maintain and improve surface water quality, consistent with the Clean Water Act, such that pollution does not imperil public health or the survival of fish, shellfish, or other aquatic life or prevent the harvest of shellfish. Surface waters within the drainage basins of Geological Sensitive Areas, and areas of significant recreational or commercial shellfish harvesting should be maintained or restored to the highest quality possible.

11. The county should prohibit uses and activities that degrade lakes, streams and shellfish beds or result in the loss of the natural functions of waterbodies, wetlands, and groundwater aquifers.

12. The county should require that sewage treatment plant owners explore opportunities for the beneficial use of treated wastewater before any new point discharges are authorized. The county should prohibit any new wastewater discharges, including those from sewage treatment plants, into waters where shellfish are harvested, if the discharges would significantly harm the shellfish or their harvest potential.

13. The county should cooperate with adjoining jurisdictions to develop complementary regulations pertaining to streams, fish, wildlife, plant habitats, and other Critical Areas that span jurisdictional boundaries.

14. The county should prevent development and activities in streams, riparian areas, wetlands, other protected wildlife habitats and any associated buffers that would damage their functions, except to the minimum extent necessary when there is no reasonable alternative for accommodating an essential use (e.g., an essential road or utility crossing).

15. The county should encourage stream and wetland restoration activities consistent with best available science through partnerships between the county, conservation district, other agencies, and landowners. Provide incentives for landowners to retain, enhance, or restore important wildlife habitat such as reduced permit fees, expedited permit review, and reduction in property taxes.

**ACTION NEEDS:**

1. Review and amend as necessary the important habitat and species section of the Critical Area regulations at least every five years to reflect best available science, relevant new information, and the results of project monitoring and evaluation.
2. Seek funding to perform stream/watershed assessments to refine riparian habitat protection programs, including refined riparian habitat area widths, and determine the need for additional complementary actions necessary to maintain habitat per Policy E-6.
3. Identify sources of contamination that jeopardize shellfish survival or harvest. Devise appropriate remedial actions to address identified water quality problems.

**F. GREENSPACES**

**GOAL:** IDENTIFY AND PROTECT IMPORTANT GREENSPACES USEFUL FOR RECREATION, TRAILS, WATER RESOURCE PROTECTION OR WHICH CONTAIN IMPORTANT WILDLIFE HABITATS.

**OBJECTIVE 1:** *Important Greenspaces Designation* – To provide for identification of important greenspaces within and adjacent to Thurston County, consistent with state law.

**POLICIES:**

1. The county should periodically update the Important Greenspaces Map (Map 31) to accurately reflect current conditions and knowledge regarding sites, open space corridors (including corridors within and between urban growth areas), and ecological units which are useful for recreation, trails, or water resource protection, contain important wildlife habitats and species, or provide connections to Critical Areas that would be useful for wildlife travel or dispersal.
2. The county should coordinate greenspaces planning with important greenspaces stakeholders (e.g., tribes, federal agencies, state departments, county departments, adjacent jurisdictions, private conservation organizations, local land trusts, resource land owners, county residents and other interested parties.)
3. The county should support greenspaces planning efforts by important greenspaces stakeholders within or adjacent to Thurston County.
4. The county should provide for extensions of urban trails that have been identified by an adjacent jurisdiction, consistent with the Important Greenspaces Map (Map

31). However, important wildlife habitats, including riparian areas, should have priority over trails. Therefore, locate, design, and construct trails to avoid significantly degrading important wildlife habitats or disrupting their use by state priority or federally protected wildlife species.

**ACTION NEEDS:**

1. Regularly update the inventory of important greenspaces.
2. Solicit information about potential important greenspaces from the following stakeholders: tribes, federal agencies, state departments, county departments, adjacent jurisdictions, private conservation organizations, local land trusts, resource land owners, county residents and other interested parties.

**OBJECTIVE 2: *Protection Options*** - Use a variety of protection options in order to protect the greatest number of priority greenspaces.

**POLICIES:**

1. The county should establish a system for identifying and prioritizing greenspaces for acquisition or other form of protection in order to maximize public benefits. The following types of lands should be considered for acquisition:
  - a. lands important to public health and safety, such as critical aquifer recharge areas for public drinking water supplies, wellhead protection areas, flood prone areas, geologically hazardous areas, and sensitive and priority watersheds defined in adopted basin plans;
  - b. lands containing environmental features with significant educational, scientific, wildlife habitat (especially areas important to the preservation of anadromous fish), natural or historic values;
  - c. lands that provide access to fresh and marine waters;
  - d. lands with recreational values, such as sites with potential to accommodate picnicking, boating, fishing, swimming, camping, trail use, nature observation, play areas and sports fields, or open space corridors within and between urban growth areas, consistent with the Important Greenspaces Map (Map 31); and
  - e. lands that provide scenic amenity or community identity.
2. The county should identify and evaluate the protection options for each important greenspace. Preservation options should include, but not be limited to: critical area designation (where appropriate), clustered development, enrollment in the open space tax program, conservation easements, purchase or transfer of development rights, and public acquisition.

3. The county should provide for identification and preservation of important greenspaces in coordination with the acquisition and development of future county parks, trails, preserves, and water resource protection areas.
4. The county should encourage private property owners to protect important greenspaces through the clustering of development on the least sensitive portion of the property.
5. The county should encourage private property owners with priority resources, according to the Public Benefit Rating System, to enroll their properties in the Open Space Tax Program.
6. The county should support efforts by land trusts and conservation organizations to acquire either fee simple property for preserves or conservation easements on private lands serving important habitat or water quality functions, protecting critical areas, or identified on the Important Greenspaces Map (Map 31).
7. The county should support efforts to protect lands identified in the Washington Department of Natural Resources Natural Heritage Data Base, through either private initiatives or public acquisition.
8. The county should support efforts by other governmental agencies to acquire and develop parks, trails or preserves within or adjacent to Thurston County, consistent with adopted park plans, the Important Greenspaces Map (Map 31), and the preservation of important wildlife habitat.
9. The county should examine, and act on as appropriate, opportunities to develop operating agreements and/or leases for land in proximity to urbanizing areas that are appropriate for preservation as open space, nature study areas or conservation areas.
10. The county should develop liaison with the Nature Conservancy, land trusts and other organizations and agencies interested in acquisition of lands for conservation and preservation.
11. The county should require, to the extent legally permissible, that areas for active recreation or open space be dedicated as part of the development approval process for residential developments containing ten or more acres that are zoned for more than one residential dwelling unit per acre, based on the demand expected to be generated by the developments for such areas.
12. The county should consider amending the open space program enrollment criteria to enable enrollment of parcels of less than five acres that contain important wildlife habitat, consistent with Chapter 84.34 RCW.
13. The county should encourage the use of special incentives to preserve and protect high quality or sensitive environmental resources that regulations do not

adequately protect or to minimize the burden of affected private property owners. The means to be used (in order of priority) include: open space taxation, the assistance of federal or state resource agencies, the initiatives of private conservation organizations and local land trusts, or public acquisition.

**ACTION NEEDS:**

1. Form a committee composed of representatives from affected county departments and greenspace stakeholders to establish a system for identifying and prioritizing greenspaces for acquisition or other form of preservation.
2. Undertake a detailed evaluation of all important greenspaces to determine the primary protection option for each site.
3. Update the Thurston County Open Space Tax Program to reflect recent changes in the state law and to facilitate private land preservation efforts.
4. Encourage private property owners with priority resources, according to the Open Space Tax Program, to enroll their properties.
5. Partner with local land trusts, conservation groups, and state and federal agencies to acquire property and/or easements on important green spaces using conservation futures monies and matching funds.

**G. AIR QUALITY**

**GOAL:** PROTECT AND IMPROVE THE COUNTY'S AIR QUALITY AND MINIMIZE OR ELIMINATE ODOR AND NOISE FROM NEW LAND USES THAT WOULD REDUCE THE LIVABILITY OF RESIDENTIAL AREAS OR SIGNIFICANTLY DEGRADE IMPORTANT WILDLIFE HABITAT.

**OBJECTIVE:** To protect the livability of established neighborhoods and to protect sensitive wildlife habitats.

**POLICIES:**

1. The county should support federal, state, and regional clean air policies and air quality standards and regulations.
2. The county should assess the impacts of new land uses and activities on air quality, including pollution, particulate matter, odor and noise. The county should direct those uses that are likely to generate health or nuisance problems away from residential neighborhoods, schools, hospitals, and facilities housing residents who are particularly susceptible to air quality problems (e.g., long-term health care centers), and wildlife refuges.
3. The county should maintain the peace and quiet of residential neighborhoods by:

- a. limiting noisy, polluting, or heavy traffic generating land uses and activities in close proximity to such areas;
  - b. through the use of screens, open space, or other buffers; and
  - c. through enforcement of noise and air emission standards.
4. The county should minimize the noise impacts from noise-producing sources, such as airports and military firing ranges, by designating noise impacted lands for use as forestry, agriculture, public reserves, industrial and, as a last priority, low density residential. Require that the deed, title, or covenants for lots in new residential subdivisions contain statements notifying prospective purchasers that the property will be affected by noise.
  5. The county should continue to coordinate with local and regional government agencies to reduce air pollution by adopting land use and transportation plans that help reduce the amount of vehicle emissions.
  6. The county should provide education and information to the public to promote reduction of air pollutants and particulate matter.

#### **H. MANAGEMENT APPROACHES**

**GOAL:** ENCOURAGE COMPREHENSIVE, SCALE-APPROPRIATE APPROACHES TO ENVIRONMENTAL RESOURCE MANAGEMENT AND COORDINATION OF MANAGEMENT ACTIONS.

**OBJECTIVE 1:** *Management Approaches-* To encourage and facilitate coordination of resource management to enable efficient use of public funds, maximize environmental and public benefits through coordinated and complementary actions, and to facilitate work at the appropriate scale (e.g., subwatershed).

**POLICIES:**

1. The county should establish management approaches that reflect our dependence on natural systems and maintain a balance between human uses and the natural environment.
2. The county should establish a pattern and intensity of land and resource use that are consistent with the limitations imposed by natural constraints (e.g., flooding, steep slopes prone to landslides, and saturated soil conditions), sustain environmental functions (e.g., aquifer recharge, water storage and cleansing performed by wetlands), and minimize public safety risks.
3. The county should assess the cumulative impacts of past, current, and planned future land and resource uses on the county's natural environment and implement management and protection programs that address these impacts.

4. The county should incorporate in management approaches, education programs; the use of incentives; regulation; restoration; construction; maintenance; county or land trust acquisition; and adaptive management, including establishing performance goals and monitoring programs, to enable evaluation of the effectiveness of implemented regulations and programs.
5. The county should provide for management at the appropriate scale (e.g., subwatershed), take into account the many factors and interests involved, and draw upon best available science.
6. The county should select a management approach that best addresses the degree of risks or hazards to the public, the uniqueness and sensitivity of the resource, and the long-term public benefit and the cost and financing feasibility.
7. The county should designate and manage Critical Areas in a manner that will sustain dependent human and wildlife use and avoid loss of life and damage to structures.
8. The county should identify and designate in the Critical Areas regulations geographic areas with unusual physical features or high sensitivity to human impacts that require management approaches specially designed for each area.

**ACTION NEEDS:**

1. Develop and implement education programs, as needed, for all environmental resources (air, land, water, and wildlife) and continue existing education programs that fulfill environmental quality objectives.
2. Develop site-specific habitat protection strategies for important stream corridors. These strategies should help identify priority areas requiring special protection, such as increased riparian habitat area widths, acquisition of easements or land, or incentive programs.
3. Work with adjoining jurisdictions, agencies, land preservation groups, conservation organizations, and tribes to coordinate management activities and acquisition of land and conservation easements for maximum beneficial impact. Convene an annual meeting with these and other stakeholders to review planned activities and identify opportunities for coordination that could yield greater benefits than independent actions. Work to develop a coordinated strategy for achieving mutual goals.
4. Seek funding to assess the current condition of the county's natural environment and the cumulative impacts on the environment of existing and planned future land and resource uses.
5. Seek funding to monitor and assess the effectiveness of implemented management and protection programs and to assess the need for additional

complementary actions to protect the natural environment consistent with the policies of this chapter.

**OBJECTIVE 2:** *Water Resource Management Approaches* – To coordinate water resources planning, funding and implementation within Thurston County to ensure high quality surface and groundwater, preserve the functions of water resources, ensure compatibility between land and water uses and minimize the costs of parallel programs.

**POLICIES:**

1. The county should manage county-wide water resources through a coordinated water resources program that integrates county groundwater, stormwater, lakes, stream and wetland programs related to water quantity and quality.
2. The county should consider the hydrologic continuity between ground and surface water when managing water resources.
3. The county should address water resource concerns by the appropriate scale, such as a catchment, subwatershed or sub-basin for surface waters and by aquifers for groundwater.
4. The county should support watershed planning processes conducted under RCW 90.82 as a framework for comprehensive water resource management.
5. The county should involve affected stakeholders in groundwater, watershed and stormwater basin planning.
6. The county should support and implement the county-adopted water resource plans addressing watersheds, stormwater, sewerage, groundwater, water supply and solid waste, including the Northern Thurston County Ground Water Management Plan and the South Thurston County Aquifer Protection Strategy.
7. The county should protect public water supplies from contamination to avoid the cost of developing new water sources.
8. The county should manage water resources for multiple beneficial uses. Use for one purpose should preserve opportunities for other uses, while maintaining overall water quality. When conflicts arise, the natural system should be given priority, particularly if the use would be detrimental to anadromous fish or public safety.
9. The county should monitor both surface water and groundwater to evaluate program effectiveness, establish long-term trends for both water quality and water quantity, and provide for the early detection of pollution, to minimize the damage and the cost of resource restoration, and to provide a basis for adaptive management.

**ACTION NEEDS:**

1. Implement the polices and action recommendations contained within county adopted water resource plans.
2. Identify and implement a long-term funding source to provide for water resource protection services including investigation and enforcement.
3. Establish a unified source of funding for water resource protection efforts to reduce multiple and piecemeal fees and charges for water protection efforts.
4. Work with other jurisdictions to merge their water quality monitoring data into a common Geographic Information System thereby making the information more accessible to the public.
5. Annually distribute a report card on county-wide water quality that includes an evaluation of the data by watershed and the type of water resource.