

## **Chapter 7**

# **CRITICAL AREAS**

## **Introduction**

The Washington State Growth Management Act (GMA) requires every county and city in Washington to adopt policies and development regulations that designate and protect critical areas. Critical areas are defined as:

- Wetland areas
- Aquifer recharge areas
- Frequently flooded areas
- Geologically hazardous areas
- Fish and wildlife habitat conservation areas

## **Desired Critical Areas Future**

### **Vision Statement – Critical Areas**

The Birch Bay Community Planning Steering Committee has included the following language in their vision statement regarding critical areas:

*“We believe that human activities should be considered as one component of a complex system of relationships among living things and their environment and that we have a responsibility to ourselves and to future generations to seek a mutually supportive balance within this system.”*

### **Goals and Policies – Critical Areas**

Goal CA 1: To commit to conservation and enhancement of critical areas for long-range benefit to all concerned

Policy CA-1a: Protect and enhance natural systems that support native fish and wildlife populations and habitat.

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Policy CA-1b: Ensure the continued existence and enhancement of fish and wildlife populations by protecting and conserving valuable fish and wildlife habitat.

Policy CA-1c: Encourage the preservation of natural river and stream functions and habitat forming marine shoreline processes that support fish and wildlife populations and preserve marine shorelines.

Policy CA-1d: Designate critical areas and buffers in Birch Bay as “sending areas” for the transfer of development rights under the Whatcom County Transfer of Development Rights program.

Policy CA-1e: Adopt an interim ordinance to require the following additional requirements until the County adopts a revised Critical Area Ordinance, projected in December, 2004:

1. on-site mitigation for all wetland disturbance or fill within the Birch Bay Urban Growth Area; and
2. no net loss of area and function of wetlands, including the function of stormwater attenuation/runoff control at a level that existed on each project site in its pre-development condition; and
3. increase building setbacks for residential structures to 150 feet from the shoreline in areas identified as steep slopes on Figure 7-1.

## Wetland Areas

### Existing Conditions

**Wetlands Definitions.** There are two generally accepted definitions of wetlands. One definition is used for regulatory purposes and it is found in the Federal Clean Water Act, Section 404, and the other for scientific purposes and it is defined by the National Academy of Sciences. Both definitions are listed below.

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Definition of Wetlands – Clean Water Act: "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands are defined by plants (hydrophytes), soils (hydric soils), and frequency of soil saturation or inundation by water."

Definition of Wetlands – National Academy of Sciences: "A wetland is an ecosystem that depends on constant or recurrent, shallow inundation or saturation at or near the surface of the substrate. The minimum essential characteristics of a wetland are recurrent, sustained inundation or saturation at or near the surface and the presence of physical, chemical and biological features reflective of recurrent, sustained inundation or saturation. Common diagnostic features of wetlands are hydric soils and hydrophytic vegetation. These features will be present except where specific physiochemical, biotic, or anthropogenic factors have removed them or prevented their development."

Application of Definitions to Local Wetland Management: At present, the wetland definitions contained in the state's Growth Management Act and the Shoreline Management Act are virtually the same as the definition used by the federal agencies under Section 404 of the Federal Clean Water Act. The Clean Water Act definition above is generally accepted by federal, state and local agencies involved in wetlands management although a more detailed definition is contained in the state Growth Management Act and Shoreline Master Programs.

**Wetlands Importance.** Whatcom County's current Comprehensive Plan provides a good summary of what wetlands mean to Whatcom County residents. This summary is presented below:

*"Wetlands are crucial environmental features in Whatcom County. Once thought of as waste areas and unproductive lands, it is now known that wetlands provide invaluable functions in aquifer recharge, groundwater storage, flood control containment, pollutant removal and purification of water supplies, as well as provision of fish and wildlife habitat. Loss of wetlands has been due to many factors including urbanization, and, to a large degree, to agricultural development and associated drainage projects."*

## **Wetlands Systems and Identification**

There are two primary scientific classification systems used by agencies to determine specific types of wetlands. One is the wetland category rating classification and the other is the Cowardin classification. For management purposes, the Department of Ecology and local governments use the wetland category rating system. This system is described in greater detail in Ecology Publication #93-74, entitled: "Washington State Wetland Rating system." The Cowardin Classification System was utilized to quantify wetland types for this plan.

**Wetland Category Rating System.** Many jurisdictions (not Whatcom County) use a wetland "category or rating" system to simplify addressing groups of similar types of wetlands. This is the type of system that is being used when citizens hear wetlands being referred to as a "Category 1, 2, 3 or 4."

A wetlands category or rating system is essentially a process and a document that differentiates wetlands according to specific characteristics or functional attributes. Permit decisions can then be considered in light of the wetland rating and the potential impact. Protective measures are varied, with the highest levels of protection given to the highest rated wetlands (Category 1). This management approach avoids a multitude of case-by-case, subjective impact determinations made by permit administrators. Ecology's rating system uses specific criteria to allow a determination of the resource value of individual wetlands within the four possible categories.

The rating value is based on wetland functions and values, sensitivity to disturbance, rarity, and irreplaceability. The management decisions which can be made according to this system include: the level of impact avoidance to require; the width of buffers necessary to protect wetlands from adjacent land development; mitigation acreage and replacement ratios; and permitted uses in wetlands. This system does not replace a functional assessment of a wetland, which is necessary in order to plan and monitor a wetland.

Although the County currently does not employ a wetlands category or rating system, such a system could be developed for specific areas such as urban type areas or certain drainages basins, such as Birch Bay to provide greater awareness by the property owner and predictability in regulatory implementation.

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**Cowardin Scientific Classification System.** As stated above, the Cowardin system was used to identify and map wetlands for the Birch Bay Plan. Definitions of classifications used:

Estuarine Wetland. Deepwater tidal wetlands and adjacent tidal wetlands that are semi-enclosed by land but have open, partly obscured, or sporadic access to the open ocean, and in which ocean water is at least occasionally diluted by freshwater runoff from the land.

Palustrine Wetland (POW). Includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5%. The Palustrine System was developed to group the vegetated wetlands traditionally called by such names as marsh, swamp, bog, fen, and prairie, which are found throughout the United States. It also includes the small, shallow, permanent or intermittent water bodies often called ponds (*POW sub-class*). Palustrine wetlands may be situated shoreward of lakes, river channels, or estuaries; on river floodplains; in isolated catchments; or on slopes. They may also occur as islands in lakes or rivers. The erosive forces of wind and water are of minor importance except during severe floods.

The emergent vegetation adjacent to rivers and lakes is often referred to as "the shore zone" or the "zone of emergent vegetation", and is generally considered separately from the river or lake. There are often great similarities between wetlands lying adjacent to lakes or rivers and isolated wetlands of the same class in basins without open water.

Emergent Wetland (PEM). Characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants. All water regimes are included except subtidal and irregularly exposed. In areas with relatively stable climatic conditions, Emergent Wetlands maintain the same appearance year after year. Emergent Wetlands occur in all Systems except the Marine. Emergent Wetlands are known by many names, including marsh, meadow, fen, prairie pothole, and slough. Areas that are dominated by pioneer plants which become established during periods of low water are not Emergent Wetlands and should be classified as Vegetated Unconsolidated Shores or Vegetated Streambeds. The Birch Bay

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wetlands study identified one sub type of estuarine wetland (E2EM) which is a small salt marsh immediately east of Birch Bay Village.

Scrub-Shrub Wetland (PSS). Includes areas dominated by woody vegetation less than 6 m (20 feet) tall (also including forests composed of young trees less than 6 m tall). The species include true shrubs, young trees, and trees or shrubs that are small or stunted because of environmental conditions. All water regimes except subtidal are included. Scrub-Shrub Wetlands may represent a successional stage leading to Forested Wetland, or they may be relatively stable communities. They occur only in the Estuarine and Palustrine Systems, but are one of the most widespread classes in the United States.

Forested Wetland (PFO). Characterized by woody vegetation that is 6 m tall or taller. All water regimes are included except subtidal. Forested Wetlands are most common in the eastern United States and in those sections of the West where moisture is relatively abundant, particularly along rivers and in the mountains. They occur only in the Palustrine and Estuarine Systems and normally possess an overstory of trees, an understory of young trees or shrubs, and a herbaceous layer.

### **Wetlands Identification - Reconnaissance Study**

Jim Wiggins (wetland biologist) performed a reconnaissance study of wetlands within the Birch Bay planning area using National Wetland Inventory data (maps), aerial photos flown in 2001 for this planning process and past survey / delineation experience in the area. The aerial photos were marked and wetlands were identified by type: palustrine emergent (PEM and E2EM), palustrine shrub/scrub (PSS), palustrine forested (PFO), and palustrine open water (POW). The reconnaissance study, while appropriate for a comprehensive planning effort in that it generally identifies wetland areas, is a preliminary evaluation and cannot take the place of the more detailed wetland delineations needed for specific project evaluations.

A scaled acreage grid was overlaid on the aerial photos to determine approximate wetland acreage figures, by scientific type, within the areas described by the Wiggins study. Numbers of acres given are "preliminary estimates" and not a precise count of actual wetland acreage. Extensive fieldwork, including delineations, would be required to provide the latter. In addition, labeling an area as a "wetland" through a study such as this does not necessarily mean that the area in question cannot be developed. It simply

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means that due consideration must be given to regulatory requirements when planning future land uses. Conversely, areas that have not been identified as wetlands by this preliminary study may, in fact, be wetlands upon closer scrutiny. Again, considerable fieldwork, possibly including a delineation, would be required to provide a definitive determination as to whether a specific property has a wetland and what type it may be. Table 7-1 gives the preliminary estimated wetland acreage by type. Figure 7-1 maps the planning area wetlands from the Wiggins reconnaissance study. For more detailed mapping of wetlands, see the aerial photos with mylar overlays. The photos are on file at the Department of Ecology Offices in Bellingham. A more detailed wetland map also appears in the Birch Bay Baseline Data Report. A Baseline Data Report was prepared specifically for each of the ten neighborhoods in the Birch Bay area.

**Table 7-1  
Preliminary Wetland Acreage Estimates By Cowardin Classification  
Acres**

Neighborhood	PEM	PSS	PFO	POW	E2EM	Total Acres
Birch Point	15	16	34	2	0	67
Birch Bay Village	0	0	0	34	2	36
Cottonwood	63	18	42	0	0	123
Hillsdale	58	64	51	2	0	175
Central Uplands	207	108	113	2	0	430
Central Reaches	29	3	12	0	0	44
State Park	0	23	19	0	0	42
Terrell Creek	242	15	10	16	0	283
Point Whitehorn	38	0	14	0	0	52
West Cherry Pt.	n/a	n/a	n/a	n/a	n/a	n/a
Totals	652	247	295	56	2	1,252

## Management of Wetlands

**Wetlands Assessment.** The County's Critical Areas Ordinance requires an assessment by County staff or consultants prior to any modification of wetlands and associated buffers or for the purposes of mitigation. The management of wetlands involves, first of all, determining their overall size, shape, functional attributes and value to the community.

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Figure 7-1  
Wetlands, Steep Slopes, Pacific Herring Habitat  
and Significant Bird Habitat

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**Size and Shape.** A delineation (precise defining/mapping) of the upland/wetland border is needed in order to come up with a management plan and mitigating measures for proposed projects. This enables the calculation of wetland acres or square footage relating to regulatory thresholds and other applicable standards.

**Attributes and Values.** Functional assessment required by the County addresses the following attributes:

- Erosion control and shoreline stabilization
- Fish habitat
- Groundwater recharge and base flow maintenance
- Stormwater attenuation including flood storage
- Water quality improvement
- Wildlife habitat

Best science in the determination of functional attributes is constantly evolving as new data and methods become available. Ecology has recently published Methods for Assessing Wetland Functions in Riverine and Depressional Wetlands Located in the Lowlands of Western Washington, Volume 1, which significantly improves the state of the science.

Once the physical functions of wetlands have been assessed, the information must be integrated into the societal values placed on identified functional attributes and the wetland's location relative to human activities e.g. urban areas, parks, schools, etc. and natural features within a watershed e.g. upland wildlife areas, waterbodies, etc. For example, a wetland may be of small size, isolated and have moderate wildlife functions, but due to its close proximity to an urban elementary school and lack of other wetlands in the city, the wetland could be given a high value for educational and scientific purposes. These societal values are expressed at the beginning of this chapter with the listing of critical areas purposes.

## Managing Agencies, Regulations and Permits

Three agencies, one federal (Army Corps of Engineers) and two state (The Department of Ecology, and the Office of Community Development) have the primary responsibilities in providing wetland policies, guidelines and regulations from which local governments can develop their own regulations and make decisions. The Corps and Ecology also have

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independent enforcement authority to require compliance with the federal and state laws that apply to wetlands, such as the Federal Clean Water Act, the State Water Pollution Control Act, and the Shoreline Management Act. At the local level, Whatcom County's regulation of wetlands is managed with two basic planning tools; the Critical Areas Ordinance and the Whatcom County Shoreline Master Program and the various regulations related to these documents e.g. clearing and grading ordinance, manure management ordinance, etc. Once wetlands have been defined, identified and mapped, the next step is applying the standards and regulations needed. Wetlands in unincorporated Whatcom County are regulated under the County's Critical Areas Ordinance and/or Shoreline Master Program.

**Critical Areas Ordinance Regulation.** The primary regulatory tool for wetland management in Whatcom County is the Critical Areas Ordinance. All wetlands are regulated with the following exceptions:

- Areas in which wetlands were created by activity; intentional or unintentional, other than by mitigation, subsequent to July 1, 1990.
- Isolated wetlands less than 1/3 acre in size.
- Any wetland hydrologically isolated, with vegetation dominated by invasive species or pasture grasses, and the dominant functions of which are restricted to stormwater storage/flood attenuation, and the functions of which are no greater than all alternative nonwetland sites on the parcel of property in question.

**County Shoreline Management Program.** The Shoreline Management Program contains many policies and regulations that apply to wetlands. Although the Shoreline Management Program applies to a smaller portion of the county i.e. the larger lakes, rivers and streams, and all marine shores, it regulates all wetlands within its jurisdiction regardless of size. Whenever a conflict in wetland regulation between the County's Critical Areas Ordinance and Shoreline Master Program arises, the more restrictive provision applies. Coastal wetlands in and adjacent to Birch Bay and wetlands along Terrell Creek are subject to the Shoreline Master Program provisions in addition to the Critical Areas Ordinance.

## Related Laws and Permits

### **Federal Laws/Permits**

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Federal Clean Water Act Section 404. Permit required for placement of dredge or fill materials including any related draining, flooding, and excavation. (Army Corps of Engineers)

Federal Clean Water Act Section 401. Requires state (Ecology) certification that the proposed project will meet state water quality standards.

Federal River and Harbor Act Section 10. Required for all construction activity related to rivers and harbors. (Army Corps of Engineers)

Federal Coastal Zone Management Act. Notice of consistency with state laws (Ecology) required for projects involving federal permits.

National Environmental Protection Act (NEPA). Full disclosure of potential impacts associated with proposed actions. (Usually agency issuing permit)

### **Primary State Laws and Permits**

State Growth Management Act. Consistency with local comprehensive plans and development regulations. Various related permits. (Local jurisdictions and Washington Office of Community Trade and Economic Development)

State Shoreline Management Act. All permits required to ensure compliance with local shoreline programs and the State SMA and implementing rules. (Local jurisdiction and Ecology)

State Water Pollution Control Act. Full compliance with water quality standards including protection of wetlands as surface waters of the state. (Ecology)

State Hydraulic Code. Permit required for all projects within wetted perimeter streams and associated wetlands. (Washington Fish & Wildlife)

State Forest Practices Act. Required for tree harvesting - Forest Practices Application addresses wetland protection and required buffers. (Washington Department of Natural Resources)

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State Environmental Policy Act. Full disclosure of potential environmental impacts associated with proposed actions. (Usually required by agency issuing permit)

### Local Laws/Permits

Consistency with county comprehensive plans, Shoreline Master Program, Critical Area Ordinance, zoning and construction ordinances. A variety of related permits are required for any proposed project, most of which specifically address wetland issues.

## Development in Wetland Areas

Most regulations allow limited development in wetland areas. Generally, development is not permitted in Category 1 wetlands areas. For development to take place in wetland areas, the developer is required to create a wetland that is 1.5 to two to three times the size of wetland that is filled in or built upon. Not only is the developer required to meet the size requirement but the developer is also required to create a wetland that has the same or higher function and value. Filling of wetlands or building upon wetlands requires the developer or builder to obtain a permit from the US Army Corps of Engineers.

To create a wetland is a costly and time consuming process. Development in wetlands occurs only in high land value areas where the cost of creating a new wetland is less than acquiring additional land for development purposes. Creating wetlands for the purpose of constructing single family residences on individual lots, seldom occurs. A developer or a builder that contemplates building on wetlands is faced with four economic considerations: 1) the cost of creating a wetland (1.5 to 3 times the size) versus the cost of acquiring additional land to get around the existing wetland; 2) the cost of hiring a wetland biologist and a landscape architect to design a replacement wetland; 3) the uncertainty of waiting a long time (sometimes two to three years) for a response form the Corps of Engineers which may turn out to be negative; and 4) development in wetlands usually runs into local opposition by environmental interest groups which, in turn, results in lengthy process and appeals through the courts (time consideration).

## Wetland Delineation

When a project involving wetlands is proposed the first step is for the applicant is to provide a delineation study in accordance with the State and Army Corps of Engineers wetlands delineation manuals. The primary function of the delineation study is to establish the boundaries and subsequent buffers needed to keep the wetland(s) intact and functioning.

The state legislature passed a law in 1995 directing Ecology to adopt a state wetland delineation manual that is consistent with the federal delineation manual (1987 Corps of Engineers manual). Ecology has adopted a Washington State Wetland Identification and Delineation Manual March 1997 Ecology Publication No. 96-94 under the Shoreline Management Act regulations (WAC 173-22). The manual is a required reference for any delineation conducted under the Shoreline Management Act. Also, local governments must use it in implementing Growth Management Act regulations. Since this manual is consistent with the 1987 Corps Manual anyone needing approval from both federal and state/local agencies should simply designate that their delineation was conducted using both the state manual and the 1987 Corps manual.

## Wetland Buffers

Buffer areas are established to protect wetland functions. The state and federal agencies require their own buffers based on their applicable regulations. Buffers required by the Critical Areas Ordinance may be increased or decreased by the County depending on site-specific characteristics and circumstances. All wetlands regulated by the county Critical Areas Ordinance are protected by a standard 100 foot buffer with the following exceptions:

- Isolated wetland areas not characterized as mature forested, fens, sphagnum, bogs, or estuarine wetlands shall be protected by a standard 50 foot buffer and,
- Isolated wet meadows are exempt from standard buffer requirements when it is determined that the wetland functions are restricted primarily to stormwater storage or attenuation.

Almost all wetland regulations require that wetlands be buffered from development. Buffer areas range from as little as 25 feet to 200 feet or more, depending on the function and value of the wetland. Most regulations

allow limited development in the buffer areas, such as walkways, yard furniture, observation platforms, and landscaping. Some regulations allow buffer averaging, meaning that a buffer area can be reduced in one place, if it is expanded in another place. Usually, wetland buffer areas can be used to calculate minimum lot size and can be used to meet building setback requirements.

### Wetland Mitigation

The County's Critical Areas Ordinance normally requires mitigation of impacts to identified wetlands and their buffers. Mitigation plans must be prepared utilizing applicable portions of Ecology's Guidelines for Developing Freshwater Wetland Mitigation Plans and Proposals, March 1984. The County then makes a determination of the extent and type of mitigation required. Mitigation is based on first avoiding the impact and secondly, minimizing impacts. Mitigation can include off-site mitigation, including wetland banking, if appropriate.

### Wetland Action Strategies

**Proposed Changes.** Whatcom County will be doing a comprehensive review of its Critical Areas Ordinance in 2004. Changes will undoubtedly result in light of such things as the current emphasis on salmon protection and enhancement. When the new Critical Areas Ordinance is adopted, all sections of this chapter; shorelines, wetlands, steep slopes, and fish & wildlife habitat should be amended as needed. A moratorium on wetland development or fill is recommended until the revised County Critical Area Ordinance is adopted.

**Wetland Banking.** The basic concept of wetland banking is to create or restore a large wetland area and use the "credit" to compensate for wetland impacts that occur elsewhere. Often, it is in the public and environmental best interest to use this approach. The concept is relatively new and guidelines are evolving at the federal and state level. This approach has the potential to elevate Birch Bay's effectiveness in providing innovative critical area stewardship and should be pursued whenever possible. Wetland banking is specifically allowed in the current Critical Areas Ordinance subject to criteria cited at Ch.16.16.245.B.

**Incentives for Wetland and Riparian Protection.** Incentives such as Open Space property tax assessment (reduced taxes),

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Conservation Easements, Density Credits, and acquisition through the County's Conservation Futures Fund are currently available and described in the Critical Areas Ordinance at Chapter 16.16.295. These incentives, singularly or in combination, could be used more effectively to preserve the priority critical areas that the community identifies.

### Best Available Science

In 1995 the Washington State Legislature added a new section to the Growth Management Act that raised the standards for designating and protecting critical areas and the protection of anadromous fisheries. RCW 36.70A.172 was added to clarify the State's goals and policies for protecting critical areas' function and values. While the Growth Management Act does not set specific state or regional development standards for critical areas protection, the statute is clear that local government must include the "best available science" when designating and protecting them.

The best available science or valid science can be described as research conducted by qualified individuals using documented methodologies that lead to verifiable results and conclusions. The work done on identifying wetlands in the Birch Bay area meets the "best available science" criteria as demonstrated below:

- Use of most recent color aerial photography at an approximate scale of 1 inch equals 200 feet.
- Identification was conducted by James Wiggins, a certified wetland biologist with over ten years of experience.
- The classification system used was the Cowardin system.
- On site inspections were conducted where aerial photo coverage did not produce definitive results.

## Aquifer Recharge Areas

### Existing Conditions

Aquifer Recharge Areas are those areas of high susceptibility to aquifer contamination as listed below. Figure 7-2 shows the Aquifer Recharge Areas in the Birch Bay planning area.

1. The project is located on either soil conservation service hydrologic soil group (HSG) A or B; or

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2. The project is located on either the Sumas Outwash geologic unit or the Nooksack River floodplain alluvium geologic unit; or
3. More than 50 percent of the documented well logs within a half-mile radius of the project indicate a static water level of less than 50 feet below the ground surface as indicated by well logs; and
4. The project is located on a subsurface above the first occurrence of water which consists of highly permeable materials that are unobstructed by poorly permeable strata.

### **Desired Future**

#### **Critical Areas Ordinance Goals**

1. To preserve, protect, and conserve Whatcom County's groundwater resources for current and future generations by protecting critical aquifer recharge areas from contamination.
2. To prioritize the management, protection and conservation of groundwater recharge areas providing groundwater which is currently used or has the potential to be a source of potable water.

#### **Project Review Process:**

1. Projects in critical aquifer areas for which Whatcom County is the lead agency under State Environmental Policy Act (SEPA) shall be evaluated for their potential adverse impacts on ground water quality and quantity.
2. A SEPA checklist shall be used as part of a critical areas supplement to assist the county in taking final action. Those activities, projects and thresholds, exempt from SEPA regulations will not be reviewed for compliance with the critical areas ordinance.
3. The SEPA official shall review the SEPA checklist and make a SEPA threshold determination. The SEPA official shall use Appendix B of the critical areas ordinance, Sources of Ground Water Contamination, and other available sources of information when reviewing a project for potential ground water contamination in critical recharge areas. The county shall condition or deny any

project to minimize the potential contamination from such sources. Conditions or denial of any project shall be based upon information and analysis contained in an environmental impact statement, a mitigated declaration of nonsignificance, or any other relevant environmental analysis.

### Frequently Flooded Areas

Frequently flooded areas are flood areas caused by rivers or creeks overflowing their banks and flooding the adjacent land area. In a marine environment, floods occur and are caused by a combination of high tides and severe wind conditions. Frequently flooded areas have been mapped by Federal Emergency Management Agency (FEMA). These maps delineate the 100 year flood area. FEMA flood area maps are used to by local governments to regulate development to assure that the lowest habitable floor in a residential structure is above the 100 year flood level. The private sector uses FEMA flood area maps to sell flood insurance.

As shown in Figure 7-3, the 100 year flood plain includes a portion of Birch Bay Village. Further, the 100 year flood area includes Birch Bay beach area up to Birch Bay Drive. The Birch Bay Drive flood area extends form Birch Bay Village to Birch Bay State Park. FEMA maps also show that Terrell Creek is subject flooding (100 year) all the way east to Jackson Road.

### Geologically Hazardous Areas

Thirty percent slopes (30 feet height in 100 foot horizontal distance) are generally considered geologically hazardous. These areas, due to steep slopes, are naturally prone to landslides or erosion. In addition, upland stormwater runoff can accelerate the landsliding factor.

### Existing Conditions

Birch Point and Point Whitehorn have been declared eroding land areas by ocean geologists such as Wolf Bauer. Figure 7-1 shows the location of steep slope areas in the Birch Bay planning area.

Figure 7-2  
Aquifer Recharge Areas

Figure 7-3  
Frequently Flooded Areas

## Action Strategies

Any building in the steep slope area should take into consideration the potential of slides or erosion caused by development. Stormwater management in these areas is of high priority. The County's Critical Areas Ordinance now requires that "projects in landslide areas must cause no increase in surface water discharge or sedimentation to other properties and shall not decrease slope stability on or off-site". In addition, the Critical Areas Ordinance encourages development clustering to reduce disturbances.

Whatcom County is in the process of updating the County Critical Areas Ordinance, which may result in increased protection of geologically hazardous areas. As an interim measure, the Birch Bay Community Plan recommends increasing building setbacks from steep slopes identified on Figure 7-1 to 150 feet until the revised Critical Area Ordinance is adopted (scheduled for December, 2004.)

## Fish and Wildlife Habitat Conservation Areas

### Existing Conditions

Birch Bay has an abundance of significant fish, shellfish, marine birds, raptors and other wildlife which, taken together, create a primary reason people enjoy living in the area. The marine shoreline tideflats and the Terrell Creek watershed provide especially high quality habitat.

**Saltwater Fish Habitat.** Birch Bay provides excellent rearing habitat for many juvenile fish, including the Pacific herring. The Washington State Coastal Zone Atlas identifies the waters off the Birch Point, Birch Bay Village Reach, Point Whitehorn and West Cherry Point neighborhoods as habitat for Pacific herring. Figure 7-1 shows the Pacific herring habitat area.

**Waterfowl and Raptor Habitat.** Birch Bay provides excellent habitat for variety of species of waterfowl and raptors. Sections of the Cottonwood, Hillsdale, Central Reaches, Central Uplands, State Park and Terrell Creek neighborhoods have been identified as medium to high density waterfowl areas. In addition, the area is prime habitat for two species of note: the Northern Bald Eagle and Great Blue Heron. Documented Northern Bald Eagle nesting sites exist in the Birch Point and Cottonwood neighborhoods. A significant Great Blue Heron Rookery exists in the State Park neighborhood. Important bird habitats are shown on Figure 7-1.

## Action Strategies

Besides the obvious values gained from acting as stewards for other living things, the fish and wildlife of Birch Bay and Terrell Creek are an important part of the community's tourism commerce. Land use decisions should integrate careful consideration of fish and wildlife populations and habitat. The County's current Critical Areas Ordinance provides this integration. Therefore there are no recommendations regarding ordinances and permits as they relate to fish and wildlife.

There are, however, strategies the community should develop to enhance awareness of and commitment to fish and wildlife habitat resources. Most of these are included in the Parks and Recreation element e.g. interpretive signage. In addition, the community should work closely with major and minor developers to encourage private voluntary efforts such as BP – Cherry Point's commitment to habitat preservation in the State Parks and Terrell Creek neighborhoods.