



Geo-Hazards

A Skagit County Critical Areas Ordinance Fact Sheet

The *Skagit County Critical Areas Ordinance (CAO)* regulates development affecting wetlands; fish and wildlife habitat conservation areas including streams; aquifer recharge areas; and frequently flooded and geologically hazardous areas.

This CAO fact sheet is one in a series, which describes the above-listed types of environmentally critical areas

protected by Skagit County under Title 14, Chapter 14.24, *Critical Areas Ordinance*, effective June 13, 1996. This has been provided to you as general information and is not intended as a substitute for the actual codes or regulations. For more information, contact Skagit County Planning & Development Services at (360) 336-9410 or visit our website at www.skagitcounty.net.

What is a geologically hazardous area?

Geologically hazardous areas are places highly susceptible to erosion, landslides, earthquakes, or other geologic events. Their designations are dependent upon slope, soil type, geologic material and hydrogeologic conditions. In Skagit County, the most hazardous of these areas are typically found along marine shorelines, stream valleys and steep slopes.

In many cases, these areas may be extremely desirable for development because of the scenic view or water and beach access, but their development may endanger people, property and surface water resources.

Does my property contain a geo-hazard?

To assist you in determining if your property contains a geo-hazard, you may contact Skagit County Planning & Development Services. They can provide you with maps of geologically hazardous areas.

Since not all geo-hazards have been identified on County resource maps, these maps should be used as a general guide for property owners.

Your property may still contain a geo-hazard that requires protection under the County's Critical Areas Ordinance.

In this case, a qualified geologist may need to visit your property to make the appropriate development recommendations.

Classification and Designation

In Skagit County, five types of geologically hazardous areas exist:

- landslide
- erosion
- seismic
- volcanic
- mine hazard

Because of the overlap that exists between the above-listed hazard areas, they have been combined into two categories: "known or suspected risk" and "unknown risk".

Erosion and Landslide Areas of Known or Suspected Risk Include:

- Those project areas located within map unit delineations #1 Andic Cryochrepts, #3 & 4 Andic Xerochrepts, #13 Birdsviwe, #47 & 48 Dystric Xerochrepts, #50 & 51 Dystic Xerothents, #63 & 65 Guemes, #69 Hoogdal, #90 Lithic Haploxerolls, #91 Marblemount, #99 Mundt and #150 & 151 Typic Croyorthods as identified in the USDA Soil Survey of Skagit County Area (1989).

- Areas identified as Unstable (U), Unstable Old Slide (UOS), Unstable Recent Slide (URS), or Unstable Bluff (UB) in the Dept. of Ecology Coastal Zone Atlas.
- Areas within 200 feet of coastal bluffs or beaches.
- Areas within 200 feet of slopes having the following characteristics: Gradients of 15% or greater with intersecting geologic contacts with permeable sediments or (sub) parallel planes of weakness.
- Areas within 200 feet of 40% slopes or steeper and with a vertical relief of 10 feet or more (severe slope).
- Those areas within 200 feet of historic failures or landslides indicated on maps or technical reports.
- Areas potentially unstable as a result of rapid stream incision, stream bank erosion or undercutting by wave action.
- Areas that are at risk of rock fall or avalanches.
- Areas located in or at the mouth of narrow canyons subject to inundation, debris flows or flooding (may be indicated by alluvial fans).

Seismic Hazards include:

- Areas that have a potential for soil liquefaction and soil strength loss during groundshaking and areas within a Holocene fault line (indicated by USGS maps and studies).

Volcanic Hazards include:

- Areas located in the volcanic hazard zone for Glacier Peak, WA or the potential volcanic hazard area of Mount Baker, WA

Areas of Unknown Geologic Hazards:

As part of any development application where no current information is available to confirm that the items identified as Known or Suspected Risk are present on or near the project area, the Critical Areas Checklist will provide a description of the known and visible site features and be used by staff during a site visit in evaluating whether a geologically hazardous area study is required.

Buffers and Building Setbacks

Most critical areas have a buffer of land that protects them from human activities. No clearing or grading is allowed within this buffer or the geologically hazardous area. A minimum buffer from landslide or erosion hazards is 30 feet.



A minimum buffer of 50 feet is required for slopes with landslide or erosion hazards with a vertical relief greater than 50 feet. The buffer may be increased by the Administrative Official for development adjacent to a marine bluff or ravine which is designated as unstable or where a larger buffer is necessary to prevent risk of damage to existing or proposed development.

Building Clearance from Ascending/Descending Slopes:

Buildings above and below slopes shall be set a sufficient distance, according to International Building Code standards, from the slope to provide protection from slope drainage, erosion and failures. Footings on or adjacent to slope surfaces shall be founded in firm material with an embedment and setback from the slope surface sufficient to provide vertical and lateral support for the footing without detrimental settlement.

Alternate Setback and Clearance:

The Building Official may approve alternate setbacks and clearances for building code reasons only. This may require an investigation and recommendation of a qualified engineer to demonstrate that the intent of these regulations has been satisfied. Such an investigation shall include consideration of material, height of slope, slope gradient, load intensity and erosion characteristics of slope material.

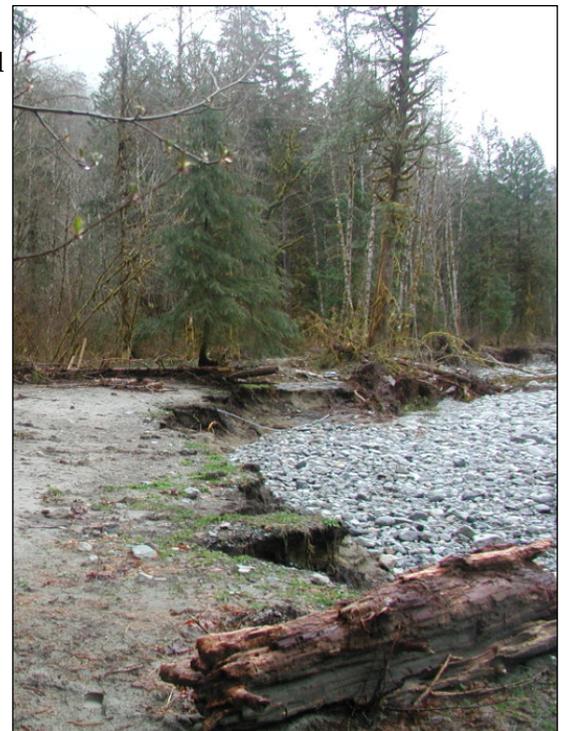
Other Restrictions and Provisions

Examples of activities that are subject to the standards contained in the CAO and other applicable federal, state, and local ordinances include:

- Building/clearing activities;
- Cut and fill slopes for road construction;
- Forest Practices, Class IV General, and Conversion Option Harvest Plans (COHPs); and
- View Corridors.

For specific information you may contact Skagit County Critical Areas staff at (360) 336-9410 or read the Critical Areas Ordinance online at www.skagitcounty.net.

Prepared by Skagit County Planning & Development Services. Special thanks to Kitsap County Community Development. February 2009.



Planning & Development Services

Steep, Hazardous and/or Unstable Slopes



Location of Structure on or near Steep Slopes/Hazardous or Unstable Areas

This handout has been developed in an attempt to inform the public or private person(s) considering investing or building upon such areas or lots. In addition to zoning setbacks and critical areas requirements the following must be considered and addressed prior to approval for construction permits:

Critical Areas Regulations

All development and land clearing proposals shall comply with SCC 14.24. Geologic hazard site assessment requirements can be found in SCC 14.24.080 and 14.24.420.

Shoreline Regulations

Within 200' of the ordinary high water mark shorelines regulations apply to property; SCC 14.26.7.13(2)(B)(4)(b) "Residential structures and accessory facilities are prohibited on accreting, eroding, slumping, or geologically unstable shorelines and where extensive shore defense and/or flood or storm protection structures would be necessary. Proposals for such development shall meet shoreline setbacks that are deemed suitable to site conditions by the Planning Department."

International Building Code Regulations

Sec. 1805.3: 2006 edition;

1805.3 Footings on or adjacent to slopes.

The placement of buildings and structures on or adjacent to slopes steeper than one unit vertical in three units horizontal (33.3-percent slope) shall conform to Sections 1805.3.1 through 1805.3.5.

1805.3.1 Building clearance from ascending slopes.

In general, buildings below slopes shall be set a sufficient distance from the slope to provide protection from slope drainage, erosion and shallow failures. Except as provided for in Section 1805.3.5 and Figure 1805.3.1, the following criteria will be assumed to provide this protection. Where the existing slope is steeper than one unit vertical in one unit horizontal (100-percent slope), the toe of the slope shall be assumed to be at the intersection of a horizontal plane drawn from the top of the foundation and a plane drawn tangent to the slope at an angle of 45 degrees (0.79 rad) to the horizontal. Where a retaining wall is constructed at the toe of the slope, the height of the slope shall be measured from the top of the wall to the top of the slope.

1805.3.2 Footing setback from descending slope surface.

Footings on or adjacent to slope surfaces shall be founded in firm material with an embedment and set back from the slope surface sufficient to provide vertical and lateral support for the footing without detrimental settlement. Except as provided for in Section 1805.3.5 and Figure 1805.3.1, the following setback is deemed adequate to meet the criteria. Where the slope is steeper than 1 unit vertical in 1 unit horizontal (100-percent slope), the required setback shall be measured from an imaginary plane 45 degrees (0.79 rad) to the horizontal, projected upward from the toe of the slope.

1805.3.3 Pools.

The setback between pools regulated by this code and slopes shall be equal to one-half the building footing setback distance required by this section. That portion of the pool wall within a horizontal distance of 7 feet (2134 mm) from the top of the slope shall be capable of supporting the water in the pool without soil support.

1805.3.4 Foundation elevation.

On graded sites, the top of any exterior foundation shall extend above the elevation of the street gutter at point of discharge or the inlet of an approved drainage device a minimum of 12 inches (305 mm) plus 2 percent. Alternate elevations are permitted subject to the approval of the building official, provided it can be demonstrated that required drainage to the point of discharge and away from the structure is provided at all locations on the site.

1805.3.5 Alternate setback and clearance.

Alternate setbacks and clearances are permitted, subject to the approval of the building official. The building official is permitted to require an investigation and recommendation of a registered design professional to demonstrate that the intent of this section has been satisfied. Such an investigation shall include consideration of material, height of slope, slope gradient, load intensity and erosion characteristics of slope material.

All engineered reports are subject to third party review by an outside engineer if the Building Official, Planning Director, or Shorelines Administrator deem it appropriate.