

## Part Two – Critical Areas

# Flood Hazard Areas

## Flood Hazard Areas Fact Sheet

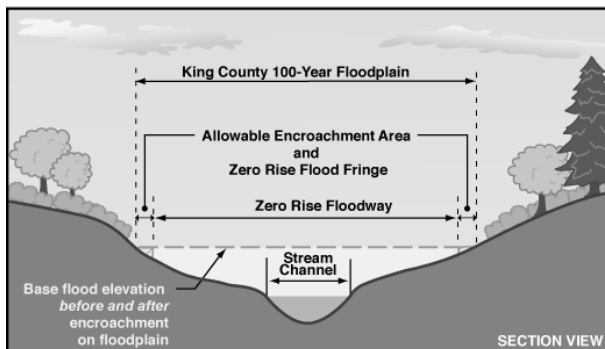
### Components of flood hazard areas

Reference CAO Sections 137, 161, 162, 163, 164, 165, 166

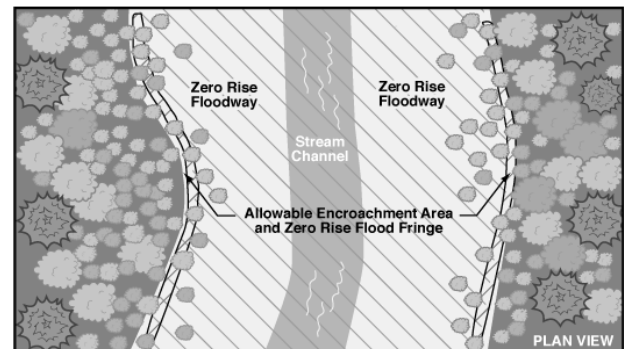
Flood hazard areas are composed of:

1. Floodplain;
2. Zero-rise flood fringe;
3. Zero-rise floodway;
4. FEMA floodway; and
5. Channel migration zones.

#### Zero-Rise Floodway (no increase in base flood elevation)



#### Zero-Rise Floodway (no increase in base flood elevation)



### Development standards in flood hazard areas

The standards established in CAO Sections 137, 161, 162, 163, 164, 165, and 166 apply to all developments that are proposed within a flood hazard area. Alterations are allowed in flood hazard areas, except for in severe channel migration hazard areas, if done in accordance with these standards. The allowed alterations in severe channel migration hazard areas are found in CAO Section 137.

### Key standards -- development in zero-rise flood fringe, zero-rise and FEMA floodway

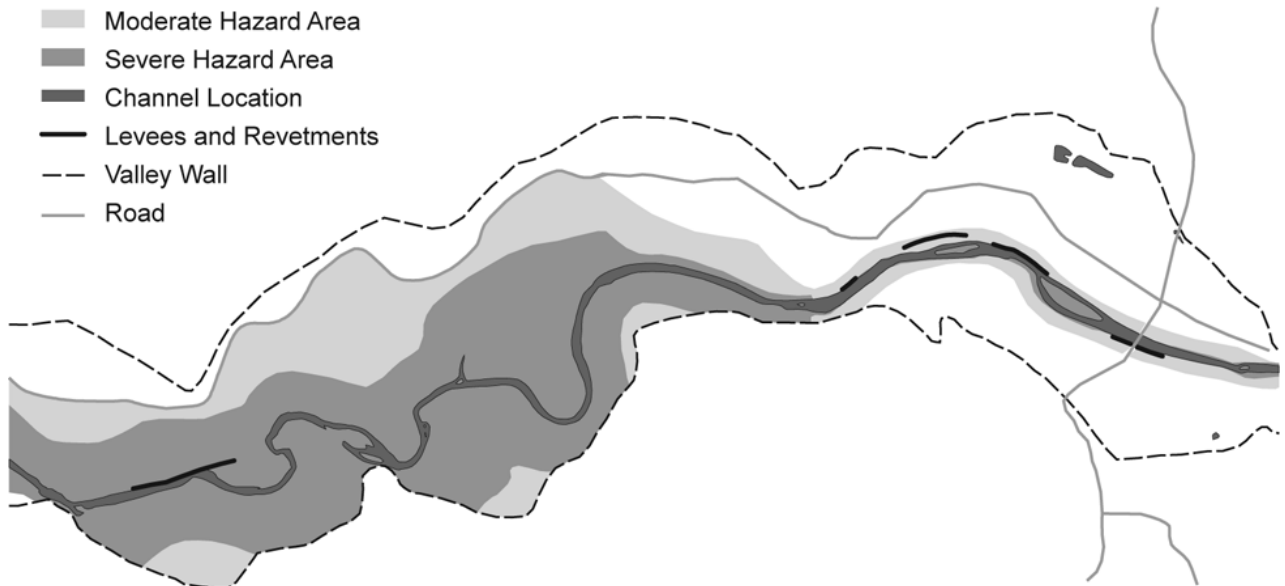
Reference CAO Sections 162, 163, 164

- Compensatory storage is required;
- No rise is allowed to the base flood elevation except under limited circumstances;
- New lots need 5,000 square feet outside the zero-rise floodway;
- Utilities must be flood-proofed, allowed only if no alternative is available;
- Elevate lowest floor one foot above base flood elevation, openings in the foundation, and use flood-resistant materials, alternatives available for nonresidential;
- Post and piling techniques required, alternatives allowed through critical areas report;
- New residences and nonresidential structures are prohibited in the FEMA floodway;
- Maintenance, repair, replacement of existing farmhouses, substantially damaged existing residential structures and historic structures in FEMA floodway if they meet certain standards;
- All structures must be anchored;
- Critical facilities only allowed in certain portion of floodplain;
- Livestock flood sanctuaries and manure storage facilities reviewed through a farm plan, not allowed in FEMA floodway; and
- Remove temporary structures and hazardous materials from floodplain during flood season.

### **Channel migration zones**

King County has prepared a number of channel migration zone maps. The existing maps as well as the criteria and process used to designate and classify channel migration zones are specified in a Public Rule adopted by the King County Department of Development and Environmental Services (DDes). A channel migration zone consists of the river channel, the severe channel migration hazard area and the moderate channel migration hazard area. If applicants disagree with the site-specific conditions or data and the adopted channel migration zone map, they can submit a critical areas report to determine the channel migration zone boundary or classification of the channel migration hazard area.

## Example channel migration zone map (plan view)



## Key standards – development in channel migration zones

*Reference CAO Sections 138 and 166*

- The standards that apply to aquatic area buffers also apply to channel migration zones when they are located within the aquatic area buffer, but the most restrictive standard applies.
- Only the alterations identified in the allowed alterations table in CAO Section 137 are allowed in a severe channel migration hazard area. See below for more details.
- Uses allowed in the moderate channel migration hazard area must be located in the area that is least subject to risk from channel migration.
- Maintenance, repair, modification, or addition to existing structures in the moderate channel migration hazard area are allowed if the footprint is not expanded toward the source of channel migration.
- New dwellings on pre-1995 lots in the moderate channel migration hazard area are allowed under certain circumstances.
- New accessory structures in the moderate channel migration hazard area are allowed under certain circumstances.
- Property subdivision in the moderate channel migration hazard area is allowed if each lot contains at least 5,000 square feet outside of the moderate channel migration hazard area and all lots have safe access routes to the lot.
- Infrastructure for new lots must be outside the moderate channel migration hazard area, except septic systems are allowed under certain circumstances.

# Flood Hazard Areas Overview

## Delineating flood hazard areas

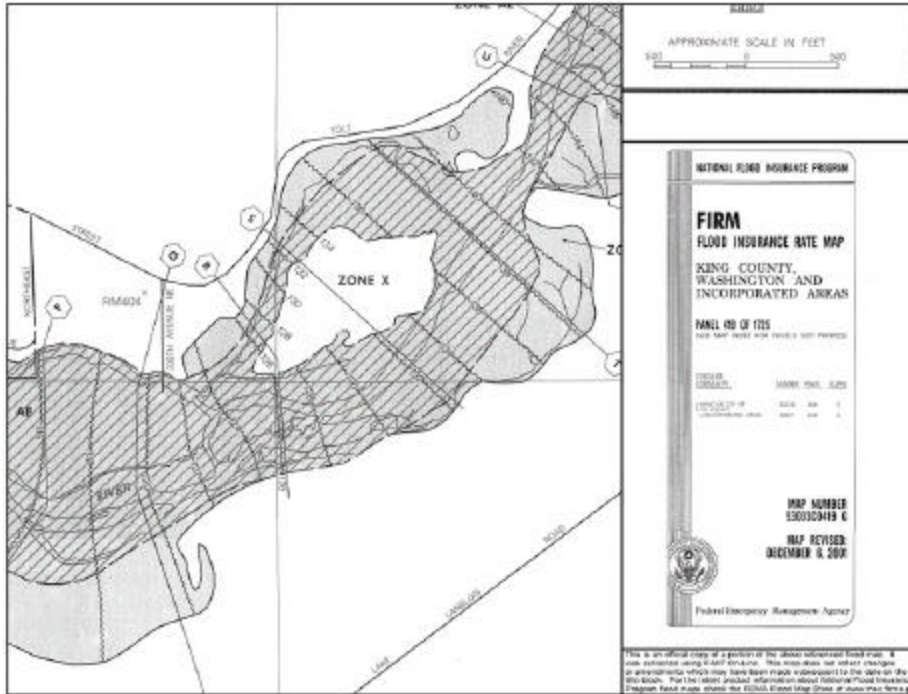
*Reference CAO Section 161*

King County delineates flood hazard areas using base flood elevations (*Reference K.C.C. 21A.06.080 for definition*) and a wide variety of flood hazard data (*Reference CAO Section 49 for definition*) for a flood having a one percent chance of being equaled or exceeded in any given year. This flood is often referred to as the "one-hundred year flood". The base flood is generally determined using existing conditions unless a basin plan or hydrologic study that has been approved by King County has been completed using projected flows under future developed conditions.

Many flood hazard areas are mapped by the Federal Emergency Management Agency (FEMA) in a scientific and engineering report entitled "The Flood Insurance Study for King County and Incorporated Areas". However when there are multiple sources of flood hazard data, King County uses the most accurate data. The kind of flood hazard data King County would use to determine a flood hazard area includes:

- Flood insurance rate maps (*Reference CAO Section 50 for definition*);
- Flood insurance studies (*Reference CAO Section 51 for definition*);
- Preliminary flood insurance rate maps (*Reference CAO Section 83 for definition*);
- Preliminary flood insurance studies (*Reference CAO Section 84*);
- Draft flood boundary work maps and associated technical reports (*Reference CAO Section 28 for definition*);
- Critical areas reports (*Reference CAO Section 147*) prepared in accordance with the FEMA standards and the King County Surface Water Design Manual;
- Letter of map amendments (*Reference CAO Section 71 for definition*);
- Letter of map revisions (*Reference CAO Section 72 for definition*);
- Channel migration zone (*Reference CAO Section 19 for definition*) maps and studies;
- Historical flood hazard information (*Reference CAO Section 65 for definition*); and
- Wind and wave data provided by the United States Army Corps of Engineers.

## Example flood insurance rate map (plan view)



## Alterations within flood hazard areas

Alterations are allowed within flood hazard areas except for in severe channel migration hazard areas if the alteration complies with the development standards for flood hazard areas. The alterations that are allowed within severe channel migration hazard areas are identified in the allowed alterations table found in *CAO Section 137*.

## Within the zero-rise flood fringe

*Reference CAO Section 162*

## Development standards

### Compensatory storage

Development proposals must not reduce the effective base flood storage volume of a floodplain. Grading or other activity that would reduce the effective storage volume must be mitigated by creating compensatory storage on the site. The compensatory storage must provide equivalent volume at equivalent elevations to that being displaced, be hydraulically connected to the source of flooding, be provided in the same construction season and before the flood season begins on

September 30, and occur on site or off site if legal arrangements can be made to assure that the effective compensatory storage volume will be preserved over time.

### **Depth and velocity analysis**

A civil engineer must prepare a base flood depth and base flood velocity analysis and submit it to the department. If the base flood depth analysis shows the depth will exceed three feet or the base flood velocity will exceed three feet per second, the department cannot approve the development.

### **Subdivisions, short subdivisions, urban planned developments and binding site plans**

New building lots are to contain 5,000 square feet or more of buildable land outside the zero-rise floodway.

All utilities and facilities such as sewer, gas, electrical and water systems are to be located and constructed consistent with "Residential: New construction standards and substantial improvements", "Nonresidential: New construction standards and substantial improvements", and "Public and private utilities" standards below.

A civil engineer must prepare detailed base flood elevations in accordance with FEMA guidelines for all new lots.

The proposal must provide adequate drainage in accordance with the King County Surface Water Design Manual.

The following must be shown on the face of the recorded subdivision, short subdivision, urban planned development and binding site plan:

- Building setback areas to restrict permanent structures to this 5,000-square-foot or greater area;
- Base flood data and sources of flood data and flood hazard notes, including the base flood elevations, required flood protection elevations (See *CAO Section 52*), the boundaries of the floodplain and the zero-rise floodway, if determined, and channel migration zone boundaries, if determined; and
- The following notice:  
"Lots and structures located within flood hazard areas may be inaccessible by emergency vehicles during flood events. Residents and property owners should take appropriate advance precautions."

### **Residential: New construction standards and substantial improvements**

The lowest floor, including basement, must be elevated to the flood protection elevation.

Do not fully enclose the portions of the structure that are below the lowest floor.

Portions of a building that are below the lowest floor area must be designed to automatically equalize hydrostatic and hydrodynamic flood forces on exterior walls by allowing for the entry and exit of floodwaters. This is to be accomplished by providing:

- A minimum of two openings on each of two opposite walls in the direction of flow with each of those walls having a total open area of not less than one square inch for every square foot of enclosed area subject to flooding;
- Design and construct the bottom of all openings so they are no higher than one foot above grade; and
- Screens, louvers or other coverings or devices are allowed over openings provided they permit the unrestricted entry and exit of floodwaters.

Materials and methods must be used that are resistant to and minimize flood damage.

Elevate or dry flood-proof (*See CAO Section 54*) to the flood protection elevation all electrical, heating, ventilation, plumbing, air-conditioning equipment and other utilities that service the structure, such as duct-work.

### **Nonresidential: New construction standards and substantial improvements**

The lowest floor must be elevated to the flood protection elevation.

If the lowest floor is not elevated to the flood protection elevation, the structure must be dry flood-proofed to the flood protection elevation. A civil or structural engineer must certify the dry flood-proofing methods are adequate to withstand flood depths, pressures, velocities, impacts, uplift forces and other factors associated with the base flood. The building permit for dry flood-proofed nonresidential structures must contain a statement that the flood insurance premiums are based upon rates for structures that are one foot below the base flood elevation.

Materials and methods must be used that are resistant to, and minimize, flood damage.

Portions of a building that are below the lowest floor area must be designed to automatically equalize hydrostatic and hydrodynamic flood forces on exterior walls by allowing for the entry and exit of floodwaters. This is to be accomplished by providing:

- A minimum of two openings on each of two opposite walls in the direction of flow with each of those walls having a total open area of not less than one square inch for every square foot of enclosed area subject to flooding;

- Design and construct the bottom of all openings so they are no higher than one foot above grade; and
- Screens, louvers or other coverings or devices are allowed over openings provided they permit the unrestricted entry and exit of floodwaters.

All electrical, heating, ventilation, plumbing, air-conditioning equipment and other utility and service facilities must be dry flood-proofed, or elevated above the flood protection elevation.

### **Elevated construction**

A structural engineer must design and certify all elevated construction and submit the design to the department.

### **Anchoring**

All new construction and substantially improved structures must be anchored to prevent flotation, collapse or lateral movement of the structure. The department must approve the method used to anchor the structures.

### **Manufactured homes**

Manufactured homes must meet all standards for flood hazard protection for conventional residential construction.

All manufactured homes must be anchored and installed using methods and practices that minimize flood damage.

All manufactured homes in a new mobile home park or expansion of an existing mobile home park must meet all standards for flood hazard protection for conventional residential construction.

Only manufactured homes are allowed in new or existing mobile home parks located in a flood hazard area.

### **Public and private utilities**

All new and replacement utilities including sewage treatment and storage facilities are to be dry flood-proofed to or elevated above the flood protection elevation.

New onsite sewage disposal systems are to be located outside the limits of the 100-year floodplain, to the extent possible. The installation of new onsite sewage disposal systems in the flood fringe may be allowed if no feasible alternative site is available. One-site sewage disposal systems must be located to avoid impairment to the system and contamination from the system during flooding.



New and replacement water supply systems must be designed to minimize or eliminate infiltration of floodwaters into the system.

Aboveground utility transmission lines, other than electric transmission lines, will only be allowed for the transport of non-hazardous substances.

Bury underground utility transmission lines transporting hazardous substances a minimum depth of four feet below the maximum depth of scour for the base flood as predicted by a professional civil engineer licensed by the State of Washington. The lines are to achieve sufficient negative buoyancy so that any potential for flotation or upward migration is eliminated.

### **Critical facilities**

Critical facilities are facilities necessary to protect the public health, safety and welfare (*See CAO Section 25*). Critical facilities may be allowed within the zero-rise flood fringe of the floodplain, but only when no reasonable alternative site is available. Critical facilities constructed within the zero-rise flood fringe must have the lowest floor elevated to three or more feet above the base flood elevation or to the 500-year flood, whichever is higher. Dry flood-proofing and sealing measures must be taken to ensure that hazardous or toxic substances will not be displaced by or released into floodwaters. Access routes to all critical facilities must be elevated to or above the base flood elevation to the nearest maintained public street or roadway.

### **Livestock flood sanctuaries: New construction or expansions of existing**



Livestock flood sanctuaries are allowed only when there is no other suitable holding area on the site outside the floodplain to which the livestock have access.

The livestock flood sanctuary must be constructed to the standards in an approved farm management plan (See CAO Section 138 and K.C.C. Chapter 21A.30). The farm management plan must demonstrate compliance with the compensatory storage and the zero-rise standards for the zero-rise floodway and FEMA floodway. Livestock flood sanctuaries must be located in areas that are least subject to flooding.

### **Livestock manure storage facilities: New construction or expansions of existing**

The livestock manure storage facilities must be constructed to the standards in an approved farm management plan (See CAO Section 138 and K.C.C. Chapter 21A.30). The farm management plan must demonstrate compliance with the compensatory storage and the zero-rise standards for the zero-rise floodway and FEMA floodway. Livestock manure storage facilities must be dry flood-proofed and elevated to the flood protection elevation and located in areas that are least subject to flooding.

## **Within the zero-rise floodway**

*Reference CAO Section 163*

### **Development standards**

In addition to the requirements below, activities within the zero-rise floodway must also conform to the requirements that apply to the zero-rise flood fringe. If a conflict exists, the more restrictive conditions will apply.

#### **Zero-rise standard**

A development proposal may not cause any increase in the base flood elevation except as follows:

- Revisions to the Flood Insurance Rate Map to incorporate the increase in base flood elevations have been adopted by FEMA in accordance with federal law (44 CFR 70); and
- Appropriate legal documents are prepared and recorded in which all property owners affected by the increased flood elevation consent to the impacts on their property.

## **Construction that is presumed to meet the zero-rise standard**

If post or piling construction techniques are used, the following are presumed to produce no increase in the base flood elevation:

- New residential structures located outside the FEMA floodway on a legal lot in existence on or before November 27, 1990, that contain less than 5,000 square feet of buildable land outside the zero-rise floodway and if the total building footprint of all existing and proposed structures on the lot does not exceed 2,000 square feet;
- A substantial improvement to an existing residential structure if it is outside the FEMA floodway and the footprint of the structure is not increased; and
- A substantial improvement of an existing residential structure if it meets the standards for new residential structures in the zero-rise flood fringe.

## **Demonstrating the proposal meets the zero-rise standard**

If post and piling construction techniques are not used, a critical areas report is required that demonstrates the proposal will not increase the base flood elevation.

## **Temporary structures and hazardous materials in the zero-rise floodway**

All temporary seasonal shelters, such as tents and recreational vehicles, stockpiles of equipment or materials, or materials the director determines are hazardous to public health, safety and welfare must be removed from the zero-rise floodway during the flood season each year between September 30 and May 1.

## **New residential construction in the zero-rise floodway**

New residential structures, substantial improvements to residential structures or structures that are accessory to a residential structure must meet the following standards:

- Locate the structure outside the FEMA floodway.
- Locate the structure only on lots in existence before November 27, 1990, that contains 5,000 square feet of buildable land outside the zero-rise floodway.
- Locate the structure the farthest distance from the channel unless the applicant can demonstrate there is an area less subject to risk.

## **Public and private utilities in the zero-rise floodway**

Public and private utilities are only allowed if they can demonstrate that a feasible alternative site is not available.

New onsite sewage disposal facilities are allowed only if the Seattle-King County Department of Public Health grants a waiver to allow the system.

The utilities must be dry flood-proofed to or elevated above the flood protection elevation.

Above ground utility transmission lines, except for electrical transmission lines, are only allowed for the transmission of non-hazardous substances.

Underground utility transmission lines transporting hazardous substances must be buried to a minimum depth of four feet below the maximum depth of scour for the base flood, as predicted by a civil engineer, and designed to achieve negative buoyancy to prevent flotation or upward migration during a flood.

### **Critical facilities in the zero-rise floodway**

Critical facilities cannot be constructed in the zero-rise floodway, except for structures that are dependent upon the zero-rise floodway below.

### **Structures dependent on the zero-rise floodway**

Installations or structures, which are floodway dependent, may be located in the floodway provided that the development proposal receives approval from all other agencies with jurisdiction and meets all standards for the zero-rise floodway.

Examples of such installations include:

- Dams or diversions for water supply, flood control, hydroelectric production, irrigation or fisheries enhancement;
- Flood damage reduction facilities such as levees, revetments and pumping stations;
- Stream bank stabilization structures where no feasible alternative exists to protecting structures, public roadways, flood protection facilities (See CAO *Section 53*). Bank stabilization projects must meet specific King County guidelines to the maximum extent possible to protect ecological and hydrological functions of salmon habitat.
- Surface water conveyance facilities;
- Boat launches and related recreation structures;
- Bridge piers and abutments; and
- Approved aquatic area or wetland restoration projects including fisheries enhancement projects.

### **Within the FEMA floodway**

*Reference CAO Section 164*

## **Development standards**

In addition to the requirements below, activities within the FEMA floodway must also conform to the requirements that apply to the zero-rise floodway. If a conflict exists, the more restrictive conditions will apply.

### **Zero-rise standard and engineer certification**

A development proposal may not cause any increase in the base flood elevation. A civil engineer must certify through hydrologic and hydraulic analyses performed in accordance with standard engineering practices that any proposed encroachment into the FEMA floodway will not result in any increase in flood levels during the occurrence of the base flood discharge.

### **New construction prohibited**

The construction or placement of new residential or nonresidential structures is not allowed within the FEMA floodway.

### **Livestock flood sanctuaries and livestock manure storage facilities prohibited**

Livestock flood sanctuaries and livestock manure storage facilities are prohibited in the FEMA floodway.

### **Substantial improvements of residential structures**

If the footprint of the existing residential structure is not increased, substantial improvement of an existing residential structure located in the FEMA floodway that meets the requirements set out in 173-158-070 WAC is presumed to produce no increase in base flood elevation and does not require a critical areas report to establish this fact.

### **Maintenance, repair, replacement or improvement of farmhouses**

A residential structure located within the agricultural production district on land that is zoned for agriculture (A) may be maintained, repaired, replaced or improved if the structure meets the standards for residential structures and utilities in the zero-rise flood fringe and also the following requirements:

- The existing residential structure must have been legally established.
- The viability of the farm is dependent upon the residential structure being in close proximity to the other agricultural structures.
- If the residential structure is going to be replaced, it is only allowed if:
  1. there is not sufficient buildable area on site outside the FEMA floodway for the replacement;

2. the replacement residential structure will not be located where it will increase the flood hazard in water depth, velocity or erosion;
3. the replacement residential structure does not increase the existing footprint; and
4. the existing residential structure, including the foundation is completely removed within ninety days of receiving a certificate of occupancy or temporary certificate of occupancy, whichever occurs first, for the replacement structure.

### **Maintenance, repair, replacement or improvement of substantially damaged residential structures**

A substantially damaged residential structure that is not located within the agricultural production district on land that is zoned for agriculture (A) may be maintained, repaired, or replaced if the structure meets the standards for residential structures and utilities in the zero-rise flood fringe and also the following requirements:

- The Washington State Department of Ecology must assess the flood characteristics of the site and determine that:
  1. the base flood depths will not exceed three feet;
  2. the base flood velocities will not exceed three feet per second;
  3. there is no evidence of flood-related erosion, as determined by the location of the project site in relationship to mapped channel migration zones, or if the site is not mapped, evidence of overflow channels and bank erosion; and
  4. there is a flood warning system or emergency plan in operation.
- The Washington State Department of Ecology must prepare a report of findings and recommendations and submit it to DDES that determines the repair or replacement will not result in an increased risk of harm to life based on the characteristics of the site.
- DDES must review and concur with the report submitted from Washington State Department of Ecology.
- The proposal to maintain, repair or replace the substantially damaged residential structure must be consistent with the findings and recommendations in the report from the Washington State Department of Ecology.
- If the substantially damaged residential structure is going to be replaced, it is only allowed if:
  1. there is not sufficient buildable area onsite outside the FEMA floodway for the replacement;
  2. the replacement structure is a residential structure built as a substitute for a previously existing residential structure of equivalent use and size; and
  3. the existing residential structure, including the foundation is completely removed within ninety days of receiving a certificate of occupancy or

temporary certificate of occupancy, whichever occurs first, for the replacement structure.

### **Maintenance or repair of historic structures**

Structures, as they are defined in the Washington State Code, that are listed as historic by King County can be maintained and repaired in the FEMA floodway if the structure meets the standards for residential or nonresidential structures and utilities in the zero-rise flood fringe.

### **Flood hazard areas – certification by engineer or surveyor**

*Reference CAO Section 165*

An applicant for a new structure or substantial improvement to an existing structure in a flood hazard area must provide a FEMA elevation certificate that has been completed by a civil engineer or land surveyor licensed by the state of Washington. The FEMA elevation certificate must document the following:

- The actual as-built elevation of the lowest floor, including the basement; and
- The actual as-built elevation to which the structure is dry flood-proofed, if required.

A copy of the elevation certificate and information on how to complete the elevation certificates is available online at the FEMA website:

<http://www.fema.gov/nfip/elvinst.shtm>

FEMA elevation certificate must be submitted before DDES issues a certificate of occupancy or temporary certificate of occupancy, whichever occurs first.

If the structure is an unoccupied structure, the FEMA elevation certificate must be submitted before DDES issues the final letter of completion or temporary letter of completion, whichever occurs first.

The civil engineer or land surveyor must indicate if the structure has a basement or not.

DDES will maintain the FEMA elevation certificates for public inspection and for certification under the National Flood Insurance Program.

### **Channel migration zones**

#### **Development standards**

*Reference CAO Section 166*

Development standards within channel migration zones (CMZs) apply only to areas that have been mapped by King County and adopted by Public Rule. The Department of Development and Environmental Services Public Rule for CMZs is online at: <http://www.metrokc.gov/ddes/pub%5Frule/acrobat/21a-24cma.pdf>.

The standards that apply to the aquatic area buffers (*CAO Section 195*) also apply to the severe channel migration hazard area and the moderate channel migration hazard area that is within the aquatic area buffer. The more restrictive standards apply where there is a conflict.

## **Moderate channel migration hazard area**

### **Development standards**

*Reference CAO Section 166*

The following standards apply to development proposals and alterations within the moderate channel migration hazard area if it is outside the aquatic area buffer.

#### **Maintenance, repair or expansion of structures**

Maintenance, repair or expansion of any use or structure is allowed provided the existing structure's footprint is not expanded towards any source of channel migration hazard, unless the applicant can demonstrate to the satisfaction of the department that such location is the least subject to risk.

#### **New primary dwelling units**

New primary dwelling units, accessory dwelling units or accessory living quarters, and required infrastructure are allowed if:

- The structure is located on a separate lot in existence on or before February 16, 1995;
- A feasible alternative location outside of the channel migration zone is not available onsite; and
- To the maximum extent practical, the structure and supporting infrastructure is located the farthest distance from any source of channel migration hazard, unless the applicant can demonstrate that an alternative location is:
  1. the least subject to risk, or
  2. within the outer third of the moderate channel migration hazard area as measured perpendicular from the channel.



## **New accessory structures**

New accessory structures are allowed if no feasible alternative is available on-site, and to the maximum extent practical, the structure is located the farthest distance from the migrating channel.

## **Subdivision of property**

The subdivision of property is allowed within the portion of a moderate channel migration hazard area located outside an aquatic areas buffer if:

- All lots contain 5,000 square feet or more of buildable land outside of the moderate channel migration hazard area;
- Access to all lots does not cross the moderate channel migration hazard area; and
- All infrastructure is located outside the moderate channel migration hazard area except that an onsite septic system is allowed in the moderate channel migration hazard area if:
  1. a feasible alternative location is not available on site, and
  2. to the maximum extent practical, the septic system is located the farthest distance from the migrating channel.

## **Severe channel migration hazard area**

Alterations are allowed within a severe channel migration hazard area if the alteration complies with the development standards and other applicable requirements of K.C.C. chapter 21A.24. The allowed alterations to a severe channel migration hazard area are identified in the table in CAO Section 137. The allowed alterations in the severe channel migration hazard area are summarized below.

## **Nonresidential structures**

Construction of nonresidential farm structures is allowed within a severe channel migration hazard area located in grazed or tilled wet meadows or buffers of wetlands or aquatic areas where:

- The site is predominately used for the practice of agriculture;
- The structure is in compliance with an approved farm management plan (*See CAO Section 138*);
- The structure is either:
  1. on or adjacent to existing nonresidential impervious surface areas, additional impervious surface area is not created waterward of existing impervious surface areas and the area was not used for crop production,
  2. higher in elevation and no closer to the critical area than its existing position, or

3. located away from existing impervious surface area that is determined to be the optimum site in the farm management plan;
- Best management practices associated with the structure specified in the farm management plan are installed and maintained;
  - Installation of fencing in accordance with K.C.C. chapter 21A.30 does not require the development of a farm management plan if required best management practices are followed and the installation does not require clearing of critical areas or their buffers;
  - In a severe channel migration hazard area portion of an aquatic area buffer, a nonresidential farm structure is allowed only if:
    1. there is no feasible alternative location on site,
    2. located where the structure is least subject to risk from channel migration,
    3. the structure is not used to house animals or store hazardous substances, and
    4. the footprint of all accessory structures within the severe channel migration hazard area will not exceed the greater of 1,000 square feet or 2% of the severe channel migration area on the site.

## Existing structures

Existing nonresidential structures may be maintained or repaired.

Expansion or replacement of existing nonresidential primary structures is allowed if:

- There is no increase of the footprint of any existing structure; and
- The expansion or replacement is not a substantial improvement (*See definition in K.C.C. 21A.06.1270*).

Expansion or replacement of existing nonresidential accessory structures is allowed if:

- Additions to the footprint will not make the total footprint of all existing structures more than 1,000 square feet; and
- There is no expansion of the footprint towards any source of channel migration unless the applicant can demonstrate the location is less subject to risk and less impact on the critical area.

## Remodeling

Interior remodeling is allowed.

## Docks or piers

Construction of new docks and piers is not allowed in a severe channel migration hazard area. Maintenance, repair or replacement of docks or piers is allowed. The allowed alterations table in CAO Section 137 establishes conditions for construction of new and maintenance of existing docks and piers in aquatic areas outside severe channel migration hazard areas. See the aquatic areas section for those standards.

## Grading

Grading of up to 50 cubic yards on lots less than 5 acres in size is allowed if conducted more than:

- 165 feet from the ordinary high water mark (*See K.C.C 21A.06.825 for definition of ordinary high water mark*) in the rural area;
- 115 feet from the ordinary high water mark in the urban area.

Construction of new slope stabilization is allowed only where erosion or landsliding threatens a structure, utility facility, roadway, driveway, public trails, aquatic area or wetland. The stabilization work must not disturb the slope and its vegetation cover or any associated critical areas, to the maximum extent practical.

Maintenance of existing slope stabilization is allowed when performed by or at the direction of a government agency in accordance with regional road maintenance guidelines. These guidelines are available on line at:

<http://www.metrokc.gov/kcdot/roads/esa/index.cfm>.

Maintenance of existing slope stabilization is allowed when not performed under the direction of a government agency only if:

- The maintenance does not involve the use of herbicides, hazardous substances, sealants or other liquid oily substances in aquatic areas, wetlands or their buffers; and
- When the maintenance or replacement of bridges or culverts involves waters used by salmonids the maintenance must be in compliance with standards established in a King County Public Rule and is limited to removal of sediment and debris from the culvert and its inlet, invert and outlet and the stabilization of the disturbed or damaged bank or channel immediately adjacent to the culvert. The maintenance or replacement shall not involve excavation of a new sediment trap adjacent to the inlet. The King County Public Rule, Sensitive areas: Maintenance of Roadside Ditches Used By Salmonids is available on line at:

<http://www.metrokc.gov/ddes/pub%5Frule/acrobat/21A-24Road-Ditch.pdf>.

## Clearing

Clearing of up to 1,000 square feet or up to a cumulative 35% of the lot is allowed if conducted more than:

- 165 feet from the ordinary high water mark (*See K.C.C 21A.06.825 for definition of ordinary high water mark*) in the rural area;
- 115 feet from the ordinary high water mark in the urban area.

Clearing is allowed for the removal of hazard trees (*See CAO Section 107 for definition of hazard tree*) and vegetation as necessary for surveying or testing purposes. Clearing is also allowed for harvesting of plants and plant materials, such as plugs, stakes, seeds or fruits, for restoration and enhancement projects.

Cutting of firewood is not allowed within a wildlife habitat conservation area. Cutting of firewood within a wildlife network is allowed in accordance with a management plan approved under K.C.C. 21A.14.270. When cutting firewood within a critical area buffer, cutting of firewood is only allowed for personal use and in accordance with an approved forest management plan or rural stewardship plan. King County has developed a Public Rule for forest management plans, which is available on line at: <http://www.metrokc.gov/recelec/archives/policies/put819pr.htm>. For information on rural stewardship plans, see CAO Section 139.

Removal of vegetation for fire safety is allowed only in buffers if it is done in accordance with best management practices approved by the King County fire marshal.

Removal of noxious weeds or invasive vegetation is allowed if conducted in accordance with an approved forest management plan, farm management plan, or rural stewardship plan. If removal of noxious weeds or invasive vegetation is not approved under a forest management plan, farm management plan or rural stewardship plan, it may be undertaken as follows:

- With hand labor, including hand-held mechanical tools, unless King County noxious weed control board otherwise prescribes the use of riding mowers, light mechanical cultivating equipment or herbicides or biological control methods. Call (206) 296-0290 or visit the King County noxious weed control Web site at: <http://dnr.metrokc.gov/wlr/lands/weeds/index.htm>.
- The area of noxious weed or invasive vegetation removal must be stabilized to avoid re-growth or regeneration of noxious weeds;
- The cleared area must be re-vegetated with native or non-invasive vegetation and stabilized against erosion; and
- Herbicide use is allowed only in accordance with federal and state law.

## Forest practices

Non-conversion Class IV -G forest practice is allowed if conducted in accordance with chapter 76.09 RCW and Title 222 WAC and a forest management plan is approved for the site by the King County Department of Natural Resources and Parks. The property owner must also provide a notice of intent in accordance with RCW 76.09.060 that the site will not be converted to non-forestry use within six years. Additional information on forest management plans is available at <http://dnr.metrokc.gov/wlr/lands/forestry/index.htm>

Class I, II, III, IV -S forest practices are allowed.

## Roads

Construction of new public road right-of-way structure (*See CAO Section 86 for definition of public road right-of-way structure*) on unimproved right-of-way and expansion of a road beyond the public road right-of-way structure are allowed if:

- There is no feasible location with less adverse impact on an aquatic area and its buffer;
- The road corridor is not located over habitat used for salmonid rearing or spawning or by any species listed as endangered or threatened by the state and federal government unless the department determines there are no other feasible crossing sites;
- The road corridor width is minimized to the maximum extent practical;
- The construction occurs during approved periods for in-stream work; and
- The corridor will not change or diminish the overall aquatic area flow peaks, duration or volume or the flood storage capacity.

Maintenance of public road right-of-way structures (*See CAO Section 86 for definition of public road right-of-way structure*) and repair, replacement or modification of a road within existing right-of-way are allowed if conducted at the direction of a government agency in accordance with regional road maintenance guidelines. These guidelines are available online at: <http://www.metrokc.gov/kcdot/roads/esa/index.cfm>.

## Driveways, private access roads, farm field access drives

Construction of driveways or private access roads is allowed if:

- An alternative access is not available;
- Impact to the critical area is minimized to the maximum extent practical including the use of walls to limit the amount of cut and fill necessary;
- The risk associated with landslide and erosion is minimized;

- Access is located where it is least subject to risk from channel migration; and
- Construction occurs during approved periods for instream work.

Construction of farm field access drives are allowed if approved through a farm management plan. See CAO Section 138 relating to farm management plans.

Maintenance of a driveway, private access road or farm field access drive is allowed. When the maintenance is not performed under the direction of a government agency, the maintenance is allowed only if:

- The maintenance does not involve the use of herbicides, hazardous substances, sealants or other liquid oily substances in aquatic areas, wetlands or their buffers; and
- When the maintenance or replacement of bridges or culverts involves waters used by salmonids the maintenance must be in compliance with standards established in a King County Public Rule and is limited to removal of sediment and debris from the culvert and its inlet, invert and outlet and the stabilization of the disturbed or damaged bank or channel immediately adjacent to the culvert. The maintenance or replacement shall not involve excavation of a new sediment trap adjacent to the inlet. The King County Public Rule, Sensitive areas: Maintenance of Roadside Ditches Used By Salmonids is available on line at:  
<http://www.metrokc.gov/des/pub%5Frule/acrobat/21A-24Road-Ditch.pdf>.

## **Bridges or culverts**

Maintenance or repair of a bridge or a culvert is allowed when performed by or at the direction of a government agency in accordance with regional road maintenance guidelines. These guidelines are available online at:  
<http://www.metrokc.gov/kcdot/roads/esa/index.cfm>. Maintenance or repair of a bridge or culvert is allowed when not performed under the direction of a government agency only if:

- The maintenance does not involve the use of herbicides, hazardous substances, sealants or other liquid oily substances in aquatic areas, wetlands or their buffers; and
- When the maintenance or replacement of bridges or culverts involves waters used by salmonids the maintenance must be in compliance with standards established in a King County Public Rule and is limited to removal of sediment and debris from the culvert and its inlet, invert and outlet and the stabilization of the disturbed or damaged bank or channel immediately adjacent to the culvert. The maintenance or replacement shall not involve excavation of a new sediment trap adjacent to the inlet. The King County Public Rule, Sensitive areas: Maintenance of Roadside Ditches Used By

Salmonids is available on line at:

<http://www.metrokc.gov/ddes/pub%5Frule/acrobat/21A-24Road-Ditch.pdf>.

Replacement of a bridge or culvert is allowed when performed by or at the direction of a government agency in accordance with regional road maintenance guidelines. These guidelines are available online at:

<http://www.metrokc.gov/kcdot/roads/esa/index.cfm>. Replacement of a bridge or culvert must be made fish passable in accordance with Washington State Department of Fish and Wildlife Habitat and Lands Environmental Engineering Division's Fish Passage Design Manual or with the National Marine and Fisheries Services Guidelines for Salmonid Passage at Stream Crossings for federally listed salmonid species. The Washington State Fish and Wildlife Service document "Design of Fish Passage at Culverts" is available at: <http://wdfw.wa.gov/hab/engineer/cm>. The National Marine and Fisheries Services guidelines for federally listed salmonid species is available at: <http://pacific.fws.gov/jobs/orojitw/standard/fish-std.htm>. The site must be restored with appropriate native vegetation.

Expansion of a bridge or culvert is allowed if it is necessary to bring the bridge or culvert up to current standards and there is no other feasible alternative solution available with less impact on the aquatic area and its buffer. The bridge or culvert must be located to the maximum extent practical to minimize impacts to the aquatic area and its buffer.

## Utilities and other infrastructure

New utility corridors or utility facilities are allowed if they are located within an existing roadway and are consistent with the regional road maintenance guidelines. These guidelines are available online at

<http://www.metrokc.gov/kcdot/roads/esa/index.cfm>.

New utilities and other infrastructure are limited to construction of pipelines, cables, wires and support structures of utility facilities within utility corridors. The following requirements must be met:

- New pipelines, cables, wires and support structures are allowed only when there is no alternative location with less adverse impact on the critical area and critical area buffer.
- New utility corridors must meet the all of the following requirements to the maximum extent practical:
  1. Do not locate over habitat used for salmonid rearing or spawning or by a species listed as endangered or threatened by the state or federal government unless the department determines that there is no other feasible crossing site.
  2. Do not locate a new utility corridor in an aquatic area if the mean annual flow rate is equal to or greater than 20 cubic feet per second.

3. Paralleling the channel or following a down-valley route near the channel should be avoided.
- To the maximum extent practical, new utility corridors must be located as follows:
    1. Minimize the width of the utility corridor;
    2. Minimize the removal of trees greater than 12 inches diameter at breast height; and
    3. Provide additional, contiguous and undisturbed critical area buffer, equal in area to the disturbed critical area buffer area including any allowed maintenance roads.
  - To the maximum extent practical, access for maintenance of utility corridors must be at limited access points into the aquatic area buffer rather than by a parallel maintenance road. If a parallel maintenance road is necessary, the following standards must be met:
    1. Minimize the width of the maintenance road to the maximum extent practical and in no event can it be greater than 15 feet; and
    2. Locate the maintenance road contiguous to the utility corridor on the side of the utility corridor farthest from the critical area.
  - New utility corridors or utility facilities must not change or diminish the overall aquatic area hydrology or flood storage capacity.
  - Construction must occur during approved periods for instream work, which is generally June 15 to September 30, or as specified in permit approvals.
  - The utility corridor must serve multiple purposes and properties to the maximum extent practical.
  - Bridges or other construction techniques that do not disturb the critical areas must be used to the maximum extent practical.
  - Bored, drilled or other trenchless crossings of the aquatic area or buffer must be laterally constructed at least 4 feet below the maximum depth of scour for the base flood.
  - Bridge piers or abutments for bridge crossing must not be placed within the FEMA floodway or the ordinary high water mark.
  - Open trenching may only be used during low flow periods and only within aquatic areas when they are dry. The department may approve open trenching of type S or F aquatic areas only if there is no feasible alternative and equivalent or greater environmental protection can be achieved.
  - Minor communication facilities may collocate on existing utility facilities if:
    1. No new transmission support structure is required; and
    2. Equipment cabinets are located on the transmission support structure.

Maintenance, repair or replacement is allowed for private individual utility service connections on site or to public utilities if the disturbed area is not expanded and no hazardous substances, pesticides or fertilizers are applied.



## **Wells and onsite sewage disposal systems**

Maintenance or repair of existing wells and onsite sewage disposal systems is allowed if the disturbed area is not expanded, clearing is limited to the maximum extent practical and no hazardous substances, pesticides or fertilizers are applied.

## **Surface water systems**

Construction of new surface water conveyance systems, surface water flow control or surface water quality treatment facilities are allowed if they are within an existing roadway and are constructed to be consistent with the regional road maintenance guidelines. These guidelines are available on line at <http://www.metrokc.gov/kcdot/roads/esa/index.cfm>. If not within the roadway, a new surface water conveyance system is allowed if constructed only with vegetation.

Maintenance, repair or replacement of existing surface water conveyance systems or surface water flow control or surface water quality treatment facilities are allowed if performed by or at the direction of a government agency in accordance with the regional road maintenance guidelines. These guidelines are available on line at <http://www.metrokc.gov/kcdot/roads/esa/index.cfm>.

Open, vegetated storm water management conveyance systems and outfall structures that simulate natural conditions may be maintained, repaired or replaced if:

- Fish habitat features necessary for feeding, cover and reproduction are included, when appropriate;
- The vegetation is maintained and added adjacent to all open channels and ponds, if necessary, to prevent erosion, filter out sediments or shade the water; and
- Bioengineering techniques are used to the maximum extent practical.

Closed, tight lined conveyance system and outfall structures may be maintained, repaired or replaced if:

- Necessary to avoid erosion of slopes; and
- Bioengineering techniques are used to the maximum extent practical.

## **Flood protection facilities**

Construction of a new flood protection facility is allowed in a severe channel migration hazard area portion of an aquatic area buffer to prevent bank erosion only if consistent with the Washington state Integrated Stream Protection Guidelines and if bioengineering (*See CAO section 11 for definition of bioengineering*) techniques

are used to the maximum extent practical, unless the applicant can demonstrate that other methods provide equivalent structural stabilization and environmental function. New flood protection facilities are only allowed in a severe channel migration hazard area to protect the following:

- Public roadways;
- Sole access routes that were in existence before February 16, 1995; or
- New primary dwelling units, accessory dwelling units or accessory living quarters and residential accessory structures located outside the severe channel migration hazard area if:
  1. the site is adjacent to or abutted by properties on both sides containing buildings or sole access routes protected by legal bank stabilization in existence before February 16, 1995. The buildings, sole access routes or bank stabilization must be located no more than 600 feet apart as measures parallel to the migrating channel; and
  2. the new primary dwelling units, accessory dwelling units, accessory living quarters or residential accessory structures are located no closer to the aquatic area than similar structures on abutting adjacent properties.

Maintenance, repair or replacement of lawfully established flood protection facilities if:

- Maintained by a public agency;
- The height of the facility is not increased;
- The linear length of the affected edge of the facility is not increased;
- The footprint of the facility is not expanded waterward;
- If consistent with the King County's Guidelines for Bank Stabilization Projects and if bioengineering (*See CAO section 11*) techniques are used to the maximum extent practical; and
- The site is restored with appropriate native vegetation.

## **Instream structures**

New instream structures (*See CAO section 68 for definition of instream structures*) or instream work is allowed if performed by or at the direction of a government agency in accordance with the regional road maintenance guidelines, which are available on line at: <http://www.metrokc.gov/kcdot/roads/esa/index.cfm>.

If the aquatic area is a type N or O, the new instream structure or work is allowed and must be done in the least impacting way and at the least impacting time of the year. It must also be done in conformance with applicable best management practices and all the affected instream and buffer features restored. If the aquatic area is a type S or F, the new instream structure or work must be included as part of a project to evaluate, restore or improve habitat, and must be sponsored or

cosponsored by a public agency that has natural resource management as a function or by a federally recognized tribe.

Existing instream structures may be maintained or repaired.

## Recreation areas

Construction of a new trail is not allowed in a wildlife habitat conservation area. Otherwise, construction of a new trail is allowed as far landward as feasible in the buffer if:

- The trail surface is not made of impervious material except that public multipurpose trails may be made of impervious materials if they meet all the requirements in K.C.C. chapter 9.12; and
- To the maximum extent practical, buffers are expanded equal to the width of the trail corridor including disturbed area.

Maintenance of outdoor public park facilities, trails and publicly improved recreation areas is allowed only if the maintenance:

- Does not involve the use of herbicides or other hazardous substances except for the removal of noxious weeds or invasive vegetation;
- When salmonids are present, the maintenance must be in compliance with the King County Public Rule for *Maintenance of Agricultural Ditches and Streams Used by Salmonids*. This Public Rule is available on line at: <http://www.metrokc.gov/ddes/pub%5Frule/acrobat/21a-24AgDitch01.pdf>; and
- Does not involve the expansion of any roadway, lawn, landscaping, ditch, culvert, engineered slope or other improved area being maintained.

## Habitat and science projects

Habitat restoration or enhancement projects are limited to:

- Those sponsored by a public agency that has natural resource management as a primary function or by a federally recognized tribe;
- Habitat restoration or enhancement projects prepared by a qualified biologist; or
- Conducted in accordance with an approved forest or farm management plan or rural stewardship plan.

Scientific sampling for salmonids is allowed if done in accordance with a scientific sampling permit issued by Washington State Department of Fish and Wildlife and where applicable, an incidental take permit issued under Section 10 of the Endangered Species Act. Contact <https://fortress.wa.gov/dfw/scp/scp/index.jsp>.

Drilling and testing is allowed for the limited clearing and grading needed to prepare a critical areas report. If associated spoils are contained onsite (i.e. in a manner that the spoils will not mobilize or erode) the following is allowed:

- Data collection and research if carried out by non-mechanical or hand-held equipment to the maximum extent practical;
- Survey monument placement;
- Site exploration and gage installation if performed in accordance with state-approved sampling protocols and accomplished to the maximum extent practical by hand-held equipment; and
- Similar work associated with an incidental take permit issued under Section 10 or consultation under Section 7 of the Endangered Species Act.

## **Agricultural Activities**

Horticulture activities, including tilling, disking, planting, seeding, harvesting, preparing soil, rotating crops and related activities, and grazing of livestock are allowed if these activities have been in existence since January 1, 2005 and there is no expansion into the critical area or critical area buffer. "Continuous existence" includes cyclical operations and managed periods of soil restoration, enhancement or other fallow states associated with these horticultural and agricultural activities.

Horticulture activities, including tilling, disking, planting, seeding, harvesting, preparing soil, rotating crops and related activities, and grazing of livestock are allowed for the expansion of existing or new agricultural activities where:

- The site is predominately involved in the practice of agriculture;
- There is no expansion into an area that
  1. has been cleared under I, II, III, IV-S forest practice permit; or
  2. is more than 10,000 square feet with tree cover at a uniform density of more than 90 trees per acre and with the predominant main stem diameter of the trees at least 4 inches in diameter at breast height, not including areas that are actively managed as agricultural crops for pulpwood, Christmas trees or ornamental nursery stock;
- The activities are in compliance with an approved farm management plan (*See CAO Section 138*); and
- All best management practices associated with the activities specified in the farm management plan are installed and maintained.

## **Livestock manure storage facilities**

Construction or maintenance of livestock manure storage facilities are allowed under the same conditions above for horticultural activities and grazing livestock, but are only allowed in grazed or tilled wet meadows or their buffers if:

- The facilities are designed to the standards of an approved farm management plan (See CAO section 138) or an approved livestock management plan in accordance with K.C.C. chapter 21A.30;
- There is no feasible alternative location available on the site; and
- The facilities are located close to the outside edge of the aquatic area buffer to the maximum extent practical.

Livestock manure storage facilities are allowed in a severe channel migration hazard area portion of an aquatic area buffer if:

- The facilities are designed to the standards of an approved farm management plan (See CAO section 138)
- There is no feasible alternative location available on the site; and
- The structure is located where it is least subject to risk from channel migration.

## **Construction or maintenance of livestock flood sanctuary**

Livestock flood sanctuaries are allowed in a severe channel migration hazard area portion of an aquatic area buffer if:

- The facilities are designed to the standards of an approved farm management plan (See CAO section 138);
- There is no feasible alternative location available on the site; and
- The structure is located where it is least subject to risk from channel migration.

## **Agricultural drainage**

Construction of agricultural drainage is allowed if in compliance with an approved farm management plan (See CAO section 138) and all best management practices associated with the activities specified in the farm management plan are installed and maintained.

Maintenance of agricultural drainage is allowed if these activities have been continuous since January 1, 2005, and there is no expansion into the critical area or critical area buffer. "Continuous existence" includes cyclical operations and managed periods of soil restoration, enhancement or other fallow states associated with these horticultural and agricultural activities. Maintenance of agricultural drainage is allowed if:

- The site is predominately involved in the practice of agriculture;

- There is no expansion into an area that has been cleared under I, II, III, IV -S or conversion IV -G forest practice permits or where there is more than 10,000 square feet with tree cover at a uniform density of more than 90 trees per acre and with the predominant main stem diameter of the trees at least 4 inches in diameter at breast height, not including areas that are actively managed as agricultural crops for pulpwood, Christmas trees or ornamental nursery stock;
- The activities are in compliance with an approved farm management plan (*See CAO Section 138*); and
- All best management practices associated with the activities specified in the farm management plan are installed and maintained.

Maintenance of an agricultural drainage that is used by salmonids is allowed if in compliance with an approved farm plan.

## **Farm ponds, fish ponds, livestock watering ponds**

Construction or maintenance of farm ponds, fish ponds, or livestock watering ponds are allowed if these activities have been in existence since January 1, 2005, and there is no expansion into the critical area or critical area buffer. "Continuous existence" includes cyclical operations and managed periods of soil restoration, enhancement or other fallow states associated with these horticultural and agricultural activities.

New farm ponds, fish ponds, or livestock watering ponds or expansion of existing farm ponds, fish ponds, or livestock watering ponds are allowed if:

- The site is predominately involved in the practice of agriculture;
- There is no expansion into an area that has been cleared under I, II, III, IV -S or conversion IV -G forest practice permits or where there is more than 10,000 square feet with tree cover at a uniform density of more than 90 trees per acre and with the predominant main stem diameter of the trees at least 4 inches in diameter at breast height, not including areas that are actively managed as agricultural crops for pulpwood, Christmas trees or ornamental nursery stock;
- The activities are in compliance with an approved farm management plan (*See CAO Section 138*); and
- All best management practices associated with the activities specified in the farm management plan are installed and maintained.

## **Cemetery graves**

Excavation of cemetery graves in established and approved cemetery is allowed. Maintenance of cemetery graves is allowed, whether in an established and approved cemetery or not.

## **Lawns, landscaping and gardening**

Maintenance of lawns, landscaping and gardening for personal consumption is allowed within existing landscaped areas or other previously disturbed areas.

## **Golf courses**

Maintenance of golf courses is allowed when not performed under the direction of a government agency only if:

- The maintenance does not involve the use of herbicides, hazardous substances, sealants or other liquid oily substances in aquatic areas, wetlands or their buffers, and
- When the maintenance or the replacement of bridges or culverts involves waters used by salmonids the work is in compliance with ditch standards in a public rule and the maintenance of culverts is limited to removal of sediment and debris from the culvert and its inlet, invert and outlet and the stabilization of the disturbed or damaged bank or channel immediately adjacent to the culvert and does not involve the excavation of a new sediment trap adjacent to the inlet. The King County Public Rule is available on line at [http://www.metrokc.gov/ddes/pub\\_rule/#rules](http://www.metrokc.gov/ddes/pub_rule/#rules) (Chapter 21A.24 Sensitive Areas: Maintenance of Ditches Used by Salmonids).