Chapter 7: Upland Vegetation, Wetlands, and Wildlife

This chapter describes vegetation and wildlife resources in the Cedar Hills Regional Landfill (CHRLF) vicinity, and the potential for affecting these resources by implementing any of the alternatives.

The environmental review determined that no significant unavoidable adverse impacts to upland vegetation, wetlands, and wildlife would be anticipated during construction or operation of any of the alternatives.

7.1 Affected Environment

Existing environmental documents were reviewed and site visits were conducted to identify and confirm vegetation resources and conditions, threatened and endangered plant species, and rare plant communities within the project area. Documents prepared specifically for the landfill were reviewed as well as data received from the U.S. Fish and Wildlife Service (USFWS), Washington State Department of Fish and Wildlife (WDFW) Priority Habitats and Species (PHS), and Washington State Department of Natural Resources (WDNR) Natural Heritage Program (NHP) (see Appendix D). Site visits were conducted in August and September 2008 and in February 2009 to confirm information contained in the agency databases and to document current conditions of vegetation communities in the project area.

7.1.1 Upland Vegetation

Based on the site visits, upland vegetation communities in the 1,000-foot buffer of the landfill include deciduous forest, mixed coniferous and deciduous forest, and shrubs and grass (Figure 7-1). The USFWS (2008) identifies one threatened plant (golden paintbrush [*Castilleja levisecta*]) and three plant species of concern (white-top aster [*Aster curtus*], stalked moonwort [*Botrychium pedunculosum*], and tall bugbane [*Cimicifuga elata*]) as occurring in King County; however, none of these plants are known to occur on the site (USFWS 2008; WDNR 2008). Additionally, no rare plants or rare plant communities are known to occur on the site (WDNR 2008).

Deciduous forest in the western and southern buffers consists primarily of red alder (*Alnus rubra*) and salmonberry (*Rubus spectabilis*) with a scattering of big leaf maple (*Acer macrophyllum*). Mixed coniferous and deciduous forest in the buffer consists of Douglas fir (*Pseudotsuga menziesii*), scattered western hemlock (*Tsuga heterophylla*), and red alder in the canopy, with an understory of Oregon grape (*Mahonia nervosa*), salal (*Gaultheria shallon*), sword fern (*Polystichum munitum*), and Robert geranium (*Geranium robertianum*).

The shrub and grass community in the western and eastern buffers includes salmonberry, evergreen blackberry (*Rubus ursinus*), Himalayan blackberry (*Rubus armeniacus*), snowberry (*Symphoricarpos albus*), red elderberry (*Sambucus racemosa*), salal, Oregon grape, Robert geranium, sword fern, bracken fern (*Pteridium aquilinum*), and grasses. The shrub and grass community in the southern portion of the western buffer, under the Bonneville Power Administration transmission line corridor, includes Scotch broom (*Cytisus scoparius*), salmonberry, Himalayan blackberry, evergreen blackberry, common tansy (*Tanacetum vulgare*), salal, Oregon grape, bracken fern, and grasses.



FIGURE 7-1
Upland Vegetation Communities

Plant species observed in the buffer of the CHRLF are listed in Table 7-1.

Table 7-1. Plants Observed in the CHRLF Buffer

Common Name	Scientific Name
Trees	
Bigleaf maple	*Acer macrophyllum*
Black cottonwood	*Populus balsamifera* spp *trichocarpa*
Douglas fir	*Pseudotsuga menziesii*
Red alder	*Alnus rubra*
Vine maple	*Acer circinatum*
Western hemlock	*Tsuga heterophylla*
Western red cedar	*Thuja plicata*
Shrubs	
Butterfly bush	*Buddleja davidii*
Devil's club	*Oplopanax horridus*
Douglas spirea	*Spiraea douglasii*
Evergreen blackberry	*Rubus laciniatus*
Himalayan blackberry	*Rubus armeniacus*
Indium plum	*Oemleria cerasiformus*
Japanese knotweed	*Polygonum cuspidatum*
Prickly currant	*Ribes lacustre*
Red elderberry	*Sambucus racemosa*
Red huckleberry	*Vaccinium parviflorum*
Red osier dogwood	*Cornus sericea*
Salal	*Gaultheria shallon*
Salmonberry	*Rubus spectabilis*
Scotch broom	*Cytisus scoparius*
Snowberry	*Symphoricarpos albus*
Thimbleberry	*Rubus parviflorus*
Trailing blackberry	*Rubus ursinus*

Table 7-1. Plants Observed in the CHRLF Buffer (cont.)

Common Name	Scientific Name
Herbs	
Bedstraw species	*Galium* species
Bracken fern	*Pteridium aquilinum*
Common tansy	*Tanacetum vulgare*
Common velvetgrass	*Holcus lanatus*
Common yarrow	*Achillea millefolium*
Creeping buttercup	*Ranunculus repens*
Curly dock	*Rumex crispus*
English ivy	*Hedera helix*
Grass species	*Poa* species
Lady fern	*Athyrium filix-femina*
Lettuce species	*Lactuca* species
Narrowleaf cattail	*Typha angustifolia*
Oregon grape	*Mahonia nervosa*
Water-parsely	*Oenanthe sarmentosa*
Purple foxglove	*Digitalis purpurea*
Reed canarygrass	*Phalaris arundinacea*
Robert geranium	*Geranium robertanianum*
Skunk cabbage	*Lysichiton americanum*
Slough sedge	*Carex obnupta*
Small-fruited bulrush	*Scirpus microcarpus*
Soft rush	*Juncus effusus*
Spotted cats ear	*Hypochaeris radicata*
St. John's wort	*Hypericum perforatum*
Stinging nettle	*Urtica dioica*
Sword fern	*Polystichum munitum*
Yellow wood violet	*Viola glabella*
Youth-on-age	*Tolmeiea menziesii*

7.1.2 Wetlands

In late 2000 and early 2001, biologists in the Ecological Services Unit of the King County Department of Natural Resources and Parks, Water and Land Resources Division visited the CHRLF to determine the presence of wetlands in the project area. Based on field investigations, Ecological Services Unit biologists identified and delineated 18 wetlands on CHRLF property. The wetland descriptions that follow are adapted from the wetland delineation report prepared by the Ecological Services Unit (KCSWD 2005).

Additionally, in February 2009, HDR biologist staff conducted field reconnaissance of the southeast corner of the CHRLF property where facilities are proposed under two of the action alternatives (Alternatives 3 and 5). No wetlands were identified in this portion of the CHRLF property. Wetlands and associated streams or ditches are shown in Figure 7-2.

Wetland NWA is located in the northern buffer of the CHRLF. Wetland NWA is a seasonally flooded or saturated wetland with forested, scrub-shrub, and emergent vegetation classes. Three water conveyance systems (Streams 1 and 2, and Ditch 1) originating from steep slopes to the south of the wetland feed Wetland NWA, which then drains to McDonald Creek, also known as Mason Creek, north of the CHRLF property.

Two large wetland complexes are located in the eastern buffer of the CHRLF. Wetlands EWA, EWB, and EWC combine and form one large wetland complex in the eastern buffer of the CHRLF. These wetlands are considered seasonally flooded or saturated, with a forested vegetation. The three wetlands are bounded by roads and have been highly disturbed by road and facility construction. The wetlands occur in slight depressions where water has collected on the disturbed soils compacted by road and facilities construction. Wetlands EWD, EWE, and EWF form another large, hydrologically connected wetland complex in the eastern buffer. This wetland complex is a depressional, seasonally flooded or saturated wetland with forested and scrub-shrub vegetation classes and drains to Stream 3.

One large wetland, Wetland SWA, is located in the southern buffer of CHRLF. Several watercourses, including Stream 5 and Ditches 2 and 3, flow through the wetland; therefore, it is considered a flooded or seasonally saturated wetland. The wetland eventually drains to Queen City Lake, off of CHRLF property. Wetland SWA contains forested and emergent vegetation classes, and open water.

Three wetlands – SWB, SWC, and SWD – are located in the southwest buffer of the landfill. These wetlands form a large, hydrologically connected wetland complex fed by Stream 6 that generally flows north to south. SWC is connected to SWB by a culvert under an access road, and SWB is connected to SWD by a culvert that passes under a berm. SWC contains shrub vegetation, SWB contains shrub and herbaceous vegetation, and SWD contains forested, scrub-shrub, and herbaceous vegetation.

Seven wetlands – WWA, WWB, WWC, WWD, WWE, WWF, and WWH – are located in the western/southwestern buffer of the landfill. Wetlands WWA and WWB form a small wetland complex connected by a small pipe under an access road that conveys water between the two wetlands. These wetlands occur in a depression, likely caused by construction of the access road. Wetlands WWA and WWB are considered seasonally flooded or saturated wetlands with forested vegetation.

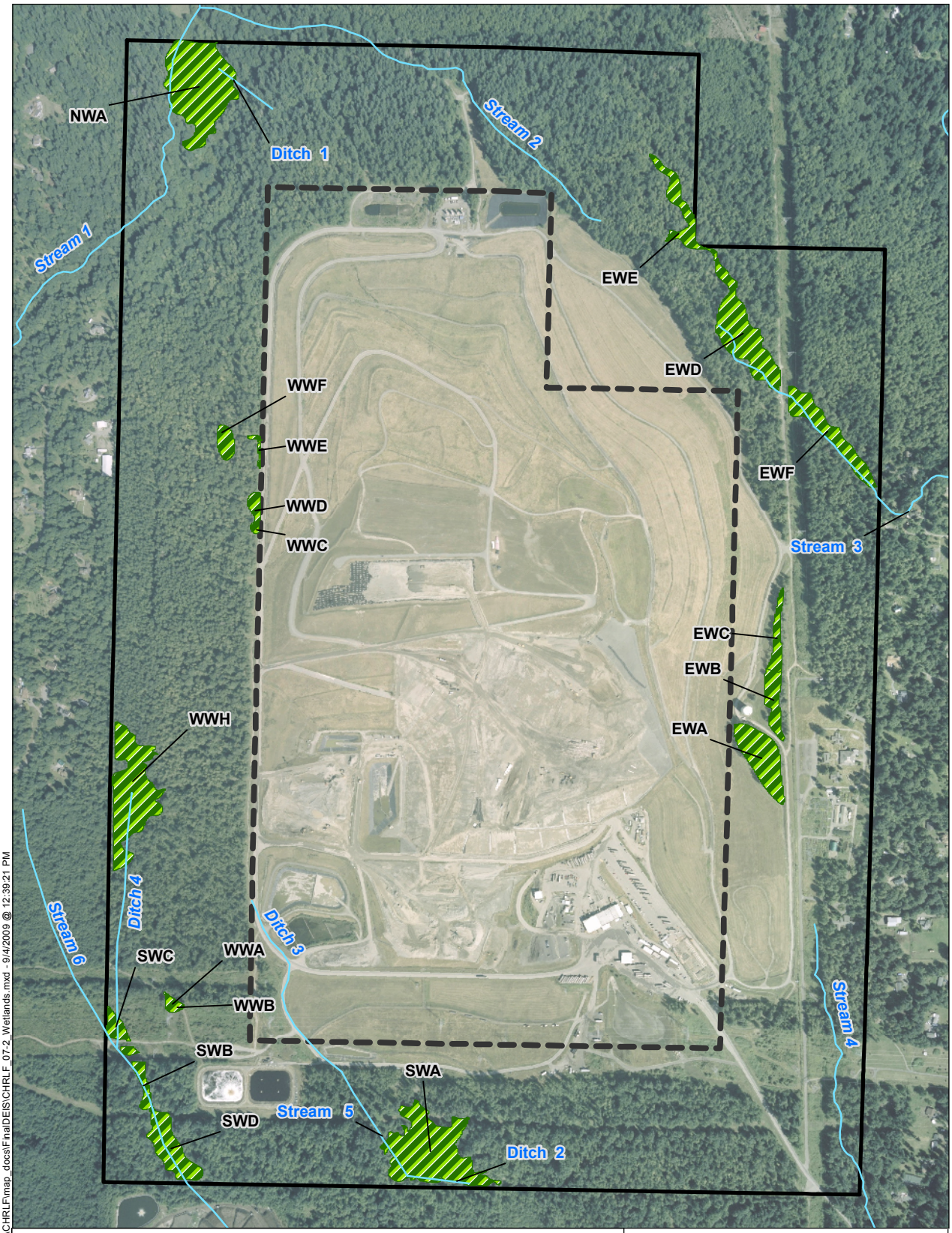


FIGURE 7-2
Wetlands

Wetlands WWC, WWD, WWE, and WWF are isolated depressions likely caused by construction of access roads and drainage ditches. These four wetlands are seasonally flooded or saturated wetlands that contain a forested vegetation class. Wetland WWH is a large wetland adjacent to the western landfill property line. Surface water runoff from landfill slopes to the east and north enters Wetland WWH, which then drains to Ditch 4 and ultimately Stream 6. Wetland WWH is considered a seasonally flooded or saturated wetland with forested vegetation.

7.1.3 Wildlife

Existing environmental documents for the CHRLF and data received from the USFWS and WDFW PHS program were reviewed to determine the presence of threatened, endangered, candidate wildlife species or species of concern in the project area. Site visits were also conducted in August and September 2008.

USFWS identifies several wildlife species occurring in King County that are listed as threatened under the Endangered Species Act; however, none of the species is documented to occur at CHRLF likely because suitable habitat is not available (WDFW 2008).

Additionally, USFWS identifies numerous candidate wildlife species and species of concern that may occur within King County and the project area. Of these species, one federal species of concern – the bald eagle – has been observed at or near CHRLF. A single bald eagle nest is located along Issaquah Creek, approximately ¼ mile northeast of the CHRLF property (WDFW 2008). Bald eagles visit CHRLF each year. In May 2007, more than 20 bald eagles were observed at or near the CHRLF (Grant 2008). Eagles observed at the site may be from the nearby nest or may be eagles from the region flying over the landfill.

Table 7-2 lists wildlife species observed at or near the CHRLF during site visits. Other wildlife species observed include black-tailed deer (see Figure 7-3), elk (see Figure 7-4), bobcat, black bear, and coyote (Grant 2008).

Table 7-2. Wildlife Species Observed at CHRLF

Common Name	Scientific Name	Sightings	Signs
Birds			
American crow	*Corvus brachyrhynchos*	X	
American robin	*Turdus migratorius*	X	
Bald eagle[1]	*Haliaeetus leucocephalus*	X	
Bewick's wren	*Thryomanes bewickii*	X	
Black-capped chickadee	*Parus atricapilus*	X	
Bufflehead	*Bucephala albeola*	X	
European starling	*Sturnus vulgaris*	X	
Gull	*Larus* species	X	
Hummingbird		X	
Mountain bluebird	*Sialia currucoides*	X	
Pileated woodpecker[1]	*Dryocopus pileatus*		X
Raven	*Corvus corax*	X	
Red-tailed hawk	*Buteo jamaicensis*	X	
Mammals			
Black-tailed deer	*Odocoileus hemionus*	X	X
Eastern cottontail	*Sylvilagus floridan*	X	
Mountain beaver	*Aplodontia rufa*		X
Raccoon	*Procyon lotor*		X

[1] The bald eagle is designated a federal species of concern by the USFWS; the Pileated woodpecker is considered a Washington state candidate species.







Figure 7-3. Black-tailed Deer at the Cedar Hills Regional Landfill

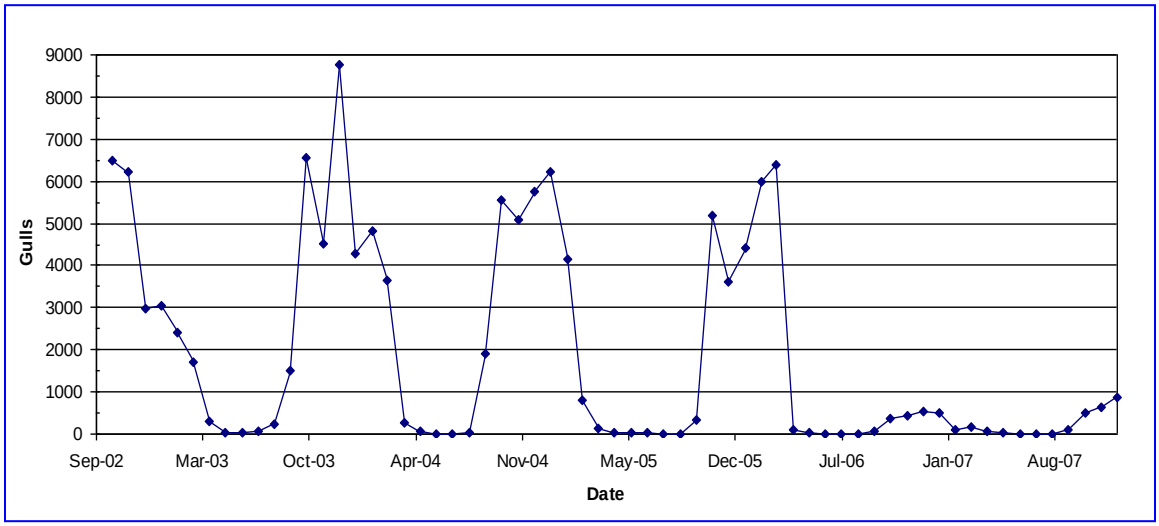


Figure 7-4. Elk at the Cedar Hills Regional Landfill

KCSWD has operated a bird control program at CHRLF for many years. The bird control program at the CHRLF has historically relied on a variety of methods to deter and harass birds to protect human health. The program has evolved by adjusting methods and activities to increase effectiveness. These efforts have decreased bird landings and feedings by more than 90 percent since peak historical observations (KCSWD 2008d). KCSWD is continuing to refine methods to increase the program's effectiveness. In recent years, part of KCSWD's commitment to decreasing bird landings and feedings has involved working with the U.S. Department of Agriculture (USDA) Wildlife Service to implement integrated bird control strategies.

The current gull management program consists of active harassment reinforced with lethal control. Active harassment includes the use of vehicles, sirens, and lights; chasing the birds on foot; pyrotechnics; and shooting (not to kill). Non-lethal harassment methods are given preference over lethal control; however, when birds no longer respond to harassment methods, lethal shooting is utilized. Lethal control is generally reserved for situations when enough birds are present to make the shooting effective reinforcement. Lethal control is supplemented by using dead bird effigies to deter birds from landing at CHRLF.

In 2006, the USDA Wildlife Service harassment program at the CHRLF was increased from a part-time activity to a full-time effort. Figure 7-5 shows the dramatic results of the full-time program beginning in 2006.



[1] Herrera 2008

Figure 7-5. Average Number of Gulls Harassed Daily September 2002 to August 2007

7.2 Environmental Impacts

7.2.1 Direct Impacts

Alternative 1 – Southwest Corner Development

No ground-disturbing activities would occur in wetlands or uplands under Alternative 1. Therefore, no wetlands or upland vegetation would be removed during construction or operation of Alternative 1.

Noise generated from construction activities is discussed in Chapter 8. Noise levels from operation of the CHRLF under Alternative 1 would be expected to be similar to noise levels from existing operations. It is not anticipated that birds and small mammals in the CHRLF buffer would be disturbed by construction activities associated with Alternative 1; however, wildlife may disperse to other habitats in or near the landfill during construction and would be likely to return to the buffer areas once construction activity was complete.

Alternative 2 – Southwest Corner and Main Stockpile Development

For the reasons stated above for Alternative 1, no impacts to upland vegetation, wetlands, or wildlife would be anticipated from construction and operation of Alternative 2.

Alternative 3 – South Area Development with Partial Wall

No wetlands would be affected during construction or operation of Alternative 3. Relocation of facilities within the southeast corner of the buffer would require removal of up to 21 acres of upland vegetation. Of the 21 acres, approximately 2 acres of shrub and grass, 9 acres of deciduous forest, and 10 acres of mixed coniferous and deciduous forest would be removed.

The 21 acres of vegetation removed in the buffer represents 8 percent of shrub and grass, 6 percent of deciduous forest, and 4 percent of mixed deciduous and coniferous forest. The overall percentage of vegetation removed would be a small percentage of the 920-acre CHRLF site. KCSWD will consider the use of Low Impact Development techniques that would enhance wildlife habitat in the affected area.

Wildlife would be affected during construction and operation of Alternative 3. During construction, birds and small mammals may disperse to and use adjacent habitats in or near the landfill. Wildlife might continue to use adjacent forest or shrub and grass habitats after construction is complete due to the permanent loss of these habitats in the southeast corner of the landfill.

Alternative 5 – South Area Development Including Support Facility Area

Impacts to upland vegetation and wildlife from implementation of Alternative 5 would be the same as those for Alternative 3. Impacts to wetlands would be the same as those for Alternative 1.

No Action Alternative

No impacts to upland vegetation, wetlands, and wildlife would be anticipated under the No Action Alternative.

Under all alternatives, the existing system of bird (gull) control would continue to operate.

7.2.2 Indirect and Cumulative Impacts

No indirect or cumulative impacts to upland vegetation, wetlands, and wildlife would be anticipated as a result of implementing any of the alternatives.

7.3 Mitigation Measures

As KCSWD continues to implement best management practices, such as those identified below, no additional mitigation will be necessary to minimize impacts to upland vegetation, wetlands, and wildlife:

- Preserve as many trees as possible and integrate existing trees into the footprint of any relocated facilities
- Revegetate areas temporarily cleared for construction activities, but not permanently removed (e.g., within the footprint of the relocated facilities), with native vegetation appropriate to the landfill.

7.4 Significant Unavoidable Adverse Impacts

No significant unavoidable adverse impacts to upland vegetation, wetlands, and wildlife would be anticipated during construction or operation of any of the alternatives.