

## D. PLANTS AND ANIMALS

### Affected Environment

#### *Plants*

The University of Washington campus property is a mosaic of upland wooded areas, wetlands, sloughs and shoreline vegetation, educational plantings, recreational and lawn areas, and developed space. The University has identified 'Unique and Significant Landscapes' that are considered to be critical to the overall campus form and that are to be conserved. These landscapes are listed in Table 7, and described in *Section III* of the *Master Plan Seattle Campus*.

**Table 7**

#### **DESIGNATED LANDSCAPES**

Medicinal Herb Garden	Campus Green
College of Forest Resources Courtyard	Denny Field
Burke Museum	Archery Range
Grieg Garden	Sylvan Theatre
Liberal Arts Quadrangle	Hanse Hall Courtyards
Central Plaza	Whitman Court Woodland Walk
Rainier Vista	Frosh Pond/Engineering Quad
HUB Yard	Fisheries Courtyard
Union Bay Natural Area	Showboat Beach
Center for Urban Horticulture	Sol Katz Memorial Garden
Hospital Glade	Memorial Way
Sakuma Viewpoint	Physics Courtyard
Denny Yard	Island Grove

#### **East Campus**

The East Campus property includes upland, wetland, riparian (slough), shoreline (Lake Washington), and playfield-related vegetation. The eastern portion of the East Campus is located on a terrace of fill capped by soil. This fill was placed in the large cattail marsh that formed in Union Bay after construction of the Lake Washington Ship Canal in 1916 (refer to the *Earth* and *Water* sections for further discussion). The Union Bay Natural Area and wetlands, established over the fill area, are the most significant landscape feature in East Campus.

Upland plant communities in the Union Bay Natural Area are dominated by European pasture grasses and perennial, herbaceous weeds, such as wild carrot (*Daucus carota*), thistle (*Cirsium* sp.), chicory (*Cichorium intybus*), and hairy cats ear (*Hypochaeris radicata*). Scots broom (*Cytisus scoparius*) and Himalayan blackberry (*Rubus discolor*), two aggressive exotic species,

also dominate patches of the natural area. Coverage by these species has declined in recent years because of management activities. Other vegetative species occurring in the East Campus area include Garry oak (*Quercus garryana*), one-seed hawthorn (*Crataegus monogyna*), and common snowberry (*Symphoricarpos albus*).

As discussed in the *Water* section (Section III C.), wetland plant communities in the East Campus are dominated by common cattail (*Typha latifolia*), yellow iris (*Iris pseudacorus*), spike rush (*Eleocharis palustris*), black cottonwood (*Populus balsamifera*), and Pacific willow (*Salix lasiandra*). Purple loosestrife (*Lythrum salicaria*) is also dominant in the East Campus wetlands, although control efforts have helped to reduce the extent of this invasive species in the East Campus. Other vegetation found in the East Campus wetlands includes red alder (*Alnus rubra*), red-osier dogwood (*Cornus stolonifera*), giant horsetail (*Equisetum telmateia*), redtop (*Agrostis alba*), and reed canarygrass (*Phalaris arundinacea*) (Pentec, 1992).

### **Central Campus**

The Central Campus area consists primarily of buildings and open areas. Key open spaces include Denny Yard, Memorial Way, the Liberal Arts Quadrangle, Hub Yard, Campus Green, Central Plaza, Engineering Quadrangle and Rainier Vista. These open areas are landscaped with both native and nonnative plant species. Tree species include Western red cedar (*Thuja plicata*), Douglas fir (*Pseudotsuga menziesii*), several species of cherry (*Prunus* spp.), bigleaf maple (*Acer macrophyllum*), hawthorn (*Crataegus* sp.), plum (*Prunus* sp.), and crabapple (*Malus* sp.). Landscaped shrubs include roses (*Rosa* sp.), English holly (*Ilex aquifolium*), and Japanese maple (*Acer palmatum*). Some small, isolated patches of native trees and shrubs, such as Western red cedar, Douglas fir, and salal (*Gaultheria shallon*), can be found in a natural condition on the periphery of the Central Campus. Many of the plants in the Central Campus area have historical significance, aesthetic importance, and are used for teaching purposes.

There are several notable landscaped areas in Central Campus. Rainier Vista is a tree-lined view corridor vital to the character and form of the campus's overall open space system. The HUB Yard is an open tree-lined lawn area to the northwest of the HUB. Denny Yard includes clusters of large, mature trees within the lawn area. The Liberal Arts Quadrangle ("The Quad") is a formal open space known for its spring show of flowering cherry trees. Engineering Quadrangle, which includes Drumheller Fountain, is a formal open space that is known for its rose gardens.

### **West and South/Southwest Campus**

The West Campus area is highly developed and contains no habitat in a natural state. Most of the vegetation in the West Campus consists of lawns and ornamental trees and shrubs in a park-like urban landscape. The most notable landscaped area in West Campus is the International Friendship Grove, a remnant of a mixed planting of trees in the median of Campus parkway with a plaque, placed to commemorate the Fifth World Forestry Congress, held at the University of Washington in 1960.

The South/Southwest Campus comprises an area of limited landscaping. Sakuma Viewpoint and Showboat Beach provide public access to the waterfront. Vegetation in the South/Southwest Campus is primarily ornamental trees, shrubs, and lawn. This area includes the University of Washington Medical Center and Magnuson Health Sciences Center, as well as other University buildings located along Portage Bay. The area is landscaped with ornamental trees and shrubs, with lawn along the shoreline.

The most notable landscape characteristics in South Campus are Sakuma Viewpoint, Showboat Beach, a small-scale park at the south-end of Brooklyn Avenue NE; waterfront open space near the Fisheries Center; the new Aquatic and Fishery Sciences courtyard; and the viewpoints/pathways along the Ship Canal.

### **Threatened and Endangered Species**

Review of endangered, threatened, and sensitive vascular plants in King County by the Washington Natural Heritage Program (Moody, 2000) indicates that no listed species are likely to occur in the habitats on the University of Washington campus. Most of the listed plant species occur in montane or subalpine zones, glacial outwash prairies, bogs, or other rare or undisturbed areas. The urbanized and disturbed habitats in the University of Washington campus are not likely refuges for any of the listed plant species.

### *Animals*

#### **Fish and Fish Habitat**

The primary fish species inhabiting Union Bay (Lake Washington), the Lake Washington ship canal, and Portage Bay include large mouth and small mouth bass (*Micropterus salmoides* and *M. dolomieu*), northern pikeminnow (*Ptychocheilus oregonensis*), peamouth chub (*Mylocheilus caurinus*), crappie (*Pomoxis* sp.), yellow perch (*Perca flavescens*), threespine stickleback (*Gasterosteus aculeatus*) and other species (Wydoski, 1972; Wydoski and Whitney, 1979). These species are tolerant of warmer water temperatures in summer (typically higher than 18° C). Less common species include coastal cutthroat (*Oncorhynchus clarki clarki*) and rainbow trout (*Oncorhynchus mykiss*) and carp (*Ctenopharyngodon* sp.). Numerous migratory species are seasonally present and include chinook (*Oncorhynchus tshawytscha*), coho (*Oncorhynchus kisutch*), and sockeye salmon (*Oncorhynchus nerka*, native, cultured and introduced stocks), and steelhead (*Oncorhynchus mykiss*). In addition, the School of Fisheries at the University of Washington maintains an established run of chinook and coho salmon. Native char (Dolly Varden/bull trout, *Salvelinus confluentus*) are found within the Lake Washington watershed (Chester Morse Reservoir), but likely rarely migrate to Lake Washington proper or Puget Sound (King County Department of Natural Resources 2000).

#### East Campus

The East Campus shoreline has been modified by riparian and shoreline development, but the majority of the shoreline is primarily natural in appearance and function. Riparian vegetation provides shading, litter fall, and insect production and fallout to the shoreline area. In this marsh and wetland area numerous small sloughs provide edge complexity, refuge areas, and foraging opportunities for many fish species. One slough or canal extends north to Montlake Boulevard NE at NE 45<sup>th</sup> Street. No fluvial drainage or habitat currently exists in this canal or in other parts of Union Bay bordering the campus. This area is managed for conservation primarily and recreation secondarily (Androskaut and Stockdale, 1999).

#### South/Southwest Campus

South/Southwest Campus borders Portage Bay and the Ship Canal (Montlake cut), south and west of the Waterfront Activities Center. The shoreline is almost completely modified with

vertical bulkheads, riprap, overwater structures, stormwater outfalls, and landscaping. The only beach area is south of the South Campus HUB. Most of the nearshore area is comprised of mixed fine sediments and mud. Overwater structures such as piers, floating docks, houseboats, or boat moorage likely provide refuge and cover for some fish species, but would be unimportant to salmonid juveniles. Natural shoreline and associated riparian vegetation is nearly non-existent. However, riparian vegetation does exist behind modified shoreline. Some vegetation remains from the golf course fairways that once existed in this part of campus and on the side slope of the Montlake Cut. This vegetation can contribute litter fall and insect fallout to the shoreline and in-water areas, but is minimally functional. This area is managed for urban and recreational uses primarily, and conservatory uses secondarily.

In summary, native, introduced and transient fish species have access to shoreline areas in Union Bay, Portage Bay, and the Ship Canal. There is minimal existing information about the habitat requirements and behavior of species in these waters. Priority Habitats and Species data from the Washington Department of Fish and Wildlife indicate that none of the commonly occurring resident species, other than salmonids are species of concern.

### Threatened and Endangered Species

Puget Sound chinook salmon and Puget Sound/Coastal bull trout were listed as threatened with extinction in 1999 under the federal Endangered Species Act (Federal Register 64 FR 14308, March 24, 1999 and 50 FR 58909, November 1, 1999). Puget Sound coho salmon are listed as a candidate species for federal protection. These species are all found in Lake Washington tributaries, including the Cedar River and Lake Sammamish watersheds. Critical habitat has been designated by the National Marine Fisheries Service for chinook salmon, and includes properly functioning habitat, where it exists, in water and riparian areas (50 FR 7764, February 16, 2000). Federal prohibitions on “take” have been established (65 FR 42422, July 10, 2000). “Take” is defined to occur when a person engages in activities that harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect a species (or attempt to do any of these)(Section 9(a) ESA). Impacts on a protected species’ habitat may harm members of that species and, therefore, constitute a “take” under the ESA. Such an act may include significant habitat modification or degradation that actually kills or injures listed fish by significantly impairing essential behavioral patterns including breeding, spawning, rearing, migrating, feeding, or sheltering. This includes prohibitions on harming or degrading critical habitat. Existing riparian and marsh habitat areas in Union Bay may provide refuge and foraging opportunities for these ESA listed fish species.

No spawning by ESA listed species occurs near the University campus. However, adult chinook salmon returning from Puget Sound must migrate past the University campus on their way to Lake Washington tributaries (Cedar River, Bear Creek, Evans Creek, Issaquah Creek, North Creek, Thornton Creek, May Creek, Kelsey Creek and others). Adult migration occurs from June through September, with a peak in late August. Juvenile salmonids, alternatively, must migrate downstream past the campus on their way to Puget Sound. However, the distribution and behavior of chinook fry in Lake Washington and their use of the lake as a rearing area and migration corridor are not well understood.

The hatchery populations of chinook and coho salmon cultured by the University of Washington School of Fisheries are distinct populations independent of ESA listed chinook salmon. These hatchery populations are reared as juveniles in the hatchery and are only released to Portage Bay when the fish are ready to migrate to Puget Sound. Thus as both juveniles and adults in

freshwater, they commingle with naturally reared populations for a very brief period and are not considered to impact ESA listed populations through ecological or behavioral pathways.

## **Terrestrial Species and Habitat**

### East Campus

The East Campus contains the best wildlife habitat in the University of Washington property, particularly in the Union Bay Natural Area. The proximity of forested, scrub-shrub, and emergent wetlands, uplands, and shoreline areas in the Union Bay Natural Area provide high quality foraging and breeding habitat for several species of birds, small mammals, reptiles, and amphibians.

Birds likely to occur in the East Campus area include songbirds, waterfowl, shorebirds, raptors, and woodpeckers. Songbird species likely to occur in the Union Bay Natural Area include American robin (*Turdus migratorius*), red-winged blackbird (*Agelaius phoeniceus*), orange-crowned warbler (*Vermivora celata*), song sparrow (*Melospiza melodia*), black-capped chickadee (*Parus atricapillus*), marsh wren (*Telmatorodytes palustris*), violet-green swallow (*Tachycineta thalassina*), and common yellowthroat (*Geothlypis trichas*) (Aanerud, 1989). Many species of waterfowl, both resident and wintering, are also likely to occur in the East Campus area, including wood duck (*Aix sponsa*), green-winged teal (*Anas carolinensis*), mallard (*Anas platyrhynchos*), Canada goose (*Branta canadensis*), Northern shoveler (*Spatula clypeata*), canvasback (*Aythya valisineria*), common goldeneye (*Bucephala clangula*), American pigeon (*Mareca americana*), greater scaup (*Aythya marila*), and lesser scaup (*Aythya affinis*) (Aanerud, 1989). In addition to songbirds and waterfowl, upland game birds, such as California quail (*Lophortyx californicus*) and ring-necked pheasant (*Phasianus colchicus*), live in the Union Bay Natural Area. Because the East Campus area lies along a shoreline, shorebirds such as great blue heron (*Ardea herodias*), spotted sandpiper (*Actitis macularia*), lesser yellowlegs (*Totanus flavipes*), and dunlin (*Erolia alpina*) are known to occur here (Aanerud, 1989).

The uplands in the Union Bay Natural Area provide foraging and nesting habitat and are contiguous with other habitats that provide escape cover. The species likely to occur here include rodents and raptors. Rodents include mice (*Peromyscus* sp.), voles (*Microtus* sp.) and shrews (*Sorex* sp.). Raptors, such as peregrine falcon (*Falco peregrinus*), red-tailed hawk (*Buteo jamaicensis*), and bald eagle (*Haliaeetus leucociphalus*) are likely to prey on these rodents. Other small mammals likely to frequent the Union Bay Natural Area include coyote (*Canis latrans*), opossum (*Didelphis virginiana*), beaver (*Castor canadensis*), raccoon (*Procyon lotor*), and Eastern gray squirrels (*Sciurus carolinensis*).

### Central, West and South/Southwest Campus

The Central, West and South/Southwest Campus areas are similar to one another in available habitat and thus are considered together. Landscaped communities provide limited foraging and nesting habitat for small mammals and for both resident and migratory songbirds common to the region. Wildlife likely to occur in these areas are primarily disturbance-tolerant or invasive species, such as European starling (*Sturnus vulgaris*), American robin, black-capped chickadee, mice, Eastern gray squirrel, and opossum.

## Threatened and Endangered Species

A bald eagle nest is located approximately 1 mile south of the Union Bay Natural Area and another approximately 1-1/2 miles east of the Union Bay Natural Area. Bald eagles typically arrive at their traditional winter feeding grounds in late October (Anderson et al., 1986). The birds generally perch during the day on the tallest trees nearest their food source. Bald eagles also roost near their major foraging areas (Rodrick and Milner, 1991). The Washington Department of Fish and Wildlife (WDFW) reports that bald eagle roosts are typically established in isolated areas in old-growth stands that have trees larger than the surrounding trees. The University of Washington's Seattle campus does not appear to have any major foraging areas, such as point bars, nor does the area include any trees of the character used by bald eagles during foraging.

## Impacts of the Proposed Action

### *Plants*

Potential development of portions of the East, West, Central, and South/Southwest Campus could have both temporary and permanent impacts on lawns, trees, and shrubs, including both native and ornamental species. Some increase in building footprints would likely come at the expense of lawns and landscaping. Construction could entail temporary impacts such as removal of lawns, trees, and shrubs, regrading, and subsequent replanting.

Impacts on plants on East Campus could include temporary loss of lawn in the vicinity of the Waterfront Activities Center and the Conibear Shellhouse. Possible construction of additional greenhouses at the Center for Urban Horticulture, although adjacent to the Union Bay Natural Area, would most likely occur on currently unvegetated or weedy gravelly fill.

As depicted by Figure 6 (*Section II* of this Final EIS), the *Master Plan Seattle Campus* would include the following additions or alterations to existing vegetated open space:

- Vegetated open space associated with potential development proximate to Denny Yard would attempt to connect seamlessly with the Yard.
- Potential development sites with pedestrian connections to the Burke-Gilman Trail or between the Central Campus and the East or South campuses would include improvements to the campus vegetated open space and entries at these points.
- The Master Plan Seattle Campus includes alternatives to modify Campus Parkway. One alternative includes consolidation of the Campus Parkway on the south alignment, creating one two-lane roadway in this portion of the Parkway. The International Friendship Grove and a mixed planting of trees in the median of Campus Parkway would possibly be altered. Trees would be planted along the sidewalk of the realigned Parkway.
- Potential development to the south-side of Gould Hall could retain the existing outdoor classroom/work yard and the Varey Memorial Garden, as consistent with the Memorandum of Agreement between Sound Transit and the University of Washington (June, 2000). The parking lot east of Henderson Hall could be developed as open space with connections to the Burke-Gilman Trail.

- The existing Sakuma Viewpoint Park, south of the Fisheries Center, would be retained. A new vegetated open space could be created on the site of the existing fish ponds; the fish ponds would be relocated to the western portion of South/Southwest Campus.
- Some existing vegetation in the area of the car-top boat launch could be disturbed under the *Proposed Action*. The area would be landscaped, resulting in a greater amount of vegetation than currently exists.
  - Potential development in the vicinity of the Greenhouses and Plant Lab would not preclude retention of the existing greenhouses.
- The *Proposed Action* includes elements to improve pedestrian connections, upgrade the campus edge along 15<sup>th</sup> Avenue NE, and incorporate the potential light rail stations. Street trees would be added and the wall along the east side of 15<sup>th</sup> Avenue NE would be removed or decreased in height.

## *Animals*

### **Fish and Fish Habitat**

Potential impacts to fish habitat could likely occur due to sedimentation, turbidity, other changes in water quality (primarily during construction), and shoreline development or alteration. Clearing, grading, building, and landscaping activities could cause soil erosion. Development sites immediately adjacent to University shorelines include nine sites 43S, 49S, 51S, 54E, 59E, 60E, 62E, 63E and 67E (see Figure 4, *Section II* of this Final EIS). Projects on these sites would likely include redevelopment or replacement of existing structures on, or adjacent to, developed shoreline. Therefore, while not likely to permanently alter or degrade natural shoreline areas below existing baseline conditions, expanded impervious surfaces and construction activity and practices could pose a significant threat to local water quality conditions.

Stormwater runoff changes the quantity and timing of natural drainage from storm events and therefore can alter the natural hydrology (water quantity and timing) of the receiving water body. Because stormwater runoff timing is compressed and quantity is dramatically elevated during this time, stormwater has significant erosive capacity. Stormwater discharges can directly affect habitat quality by scouring the benthos and littoral shoreline areas. However, because the University's stormwater receiving areas are large water-bodies, retention/detention controls have not routinely been applied. Although stormwater impacts are localized and do not affect a large proportion of the habitat available to species of concern in Union Bay, the Ship Canal, and Portage Bay, continued increases in stormwater discharges from University development do have the potential to degrade benthos and shoreline alike in the receiving water bodies.

New stormwater discharges will be generated not only from building footprints, but also from new sidewalks or other building approaches, new roads, loading areas, and parking. Direct and indirect effects on water quality from development could create short-term and cumulative impacts. Impacts to water quality include temperature changes, changes in nutrient content, chemical contamination, petroleum contamination, and changes in dissolved oxygen and oxygen demand. These changes not only affect water quality directly, and the behavior, physiology and growth of fish species, but could also create conditions where native and

introduced predators or competitors thrive, or the abundance of prey resources changes or declines.

Potential development impacts to fish species commonly occurring in Union Bay, Portage Bay, and the Ship Canal could occur. Potential impacts on healthy fish populations are best evaluated on a project-specific basis. Provided that proper erosion and sedimentation controls, stormwater management, and other mitigation measures are implemented, it is unlikely that such fish would be significantly affected by development.

### Threatened and Endangered Species

In general, development activities have the potential to significantly impact ESA listed salmon and trout and their critical habitat. Examples of such impacts include: elimination of functional riparian habitat, direct and indirect effects of new (increased) stormwater discharges, direct and indirect effects of soil erosion (sedimentation and turbidity) from development, and direct and indirect effects on water quality from development (e.g., petroleum or chemical spill, or leaching).

Under the *Master Plan Seattle Campus*, development activities would be planned and implemented in a manner that avoids or mitigates impacts through compliance with federal, state, and local regulation.

### **Terrestrial Species and Habitat**

Trees, shrubs, buildings, and open space on the developed and urbanized majority of the campus provide limited habitat for disturbance-tolerant birds and small mammals. These include the American crow, American robin, European starling, black-capped chickadee, and small mammals, mainly Eastern gray squirrels. The Central Campus areas most likely to be affected, along portions of the eastern and western perimeters, provide some habitat for birds. Species nesting in these areas would be displaced as a result of any habitat loss.

A majority of the habitat lost in the West Campus would be landscaped urban areas. These vegetative communities are relatively small and isolated, and have relatively low habitat values. The South/Southwest Campus areas provide no natural habitat, only small, isolated, landscaped urban areas. Because the shoreline is currently developed, any proposed new construction in this area would have no permanent adverse effects on waterfowl habitat, but could cause temporary disturbance during construction.

### Threatened and Endangered Species

Development under the *Master Plan Seattle Campus* would not adversely affect bald eagle habitat in the vicinity.

### Impacts of the Alternatives

#### *No Action Alternative*

Plants or animals associated with the No Action Alternative would be managed according to the GPDP. Because less development would occur under the GPDP, fewer impacts to plant and animal communities would likely occur. However, the University population would increase (as

described for the *Proposed Action*) and open spaces could be subjected to more intensive use. As a result, vegetation and wildlife habitat could be disturbed.

### *Decentralized/Open Space Alternative*

This alternative would include less development than under the proposed *Master Plan Seattle Campus* (approximately 50 percent less development). More vegetated open space would be retained, but fewer open space improvements would occur. Overall, on-campus impacts to plant and animal communities and individual species would be reduced under this alternative. Such impacts could be displaced, leading to an increase in decentralized or off-campus development activity.

### *No Street and Alley Vacations Alternative*

In comparison to the proposed *Master Plan Seattle Campus*, the amount of building footprint associated with new development would be reduced by approximately 26,000 sq.ft. Without street and alley vacations, the potential for erosion and an increase in stormwater runoff volumes would be generally the same as under the proposed *Master Plan Seattle Campus*. Impacts to plants and animals would be similar to that described for the proposed *Master Plan Seattle Campus*.

### *Lifting of Lease Limit*

The pace of development activity in the University District could increase with the lifting of the lease limit. New development in the University District would be required to conform with the City of Seattle's development, tree ordinance/regulations, landscaping and sensitive areas standards, and would not be anticipated to significantly impact plant or wildlife habitat.

### Possible Mitigation Measures

Plant and animal mitigation opportunities include impact avoidance (e.g., working when fish species are not particularly sensitive to disturbance or avoiding identified terrestrial habitats), stormwater drainage control, site and construction best management practices (BMP), alternative site design (including vegetation retention, landscaping, and alternatives to open parking lots), and habitat enhancement or restoration. Planned development would be sensitive to the existing shoreline.

All development would comply with federal, state and local regulatory standards for development and mitigation that the University of Washington, as a public entity, is required to follow. BMPs should be developed and rigorously followed for both general and site specific development activities, especially if development in sensitive areas has been permitted. BMPs, as specified by regulation, would include: site disturbance controls, construction staging, erosion and spill control, drainage control (water quantity and quality), vegetation retention and re-vegetation plans, and BMP training and monitoring.

Stormwater controls would be applied during construction activities and over the long term. Compliance would be measured against requirements set forth by the City of Seattle Stormwater, Drainage, and Erosion Control Requirements (SMC 22.802.015). These controls and BMPs would control on-site erosion and transport of sediment and pollutants off site, by

minimizing disturbance, stabilizing unworked materials, applying vegetative or mulch controls, and implementing other controls to reduce and treat contaminants in drainage water. In addition, controls could address the release rate of stormwater discharge depending on project size (SMC 22.802.015).

Potential additional mitigation measures could include:

- In response to the statewide listings of salmonids under the Endangered Species Act, the University could adopt additional water quality control measures and coordinate with the National Marine Fisheries Service, U.S. Environmental Protection Agency, Washington Department of Ecology and other federal and state agencies, as required.
- Vegetation controls could continue to include an Integrated Pest Management Plan and a revegetation plan that emphasizes the propagation of native scrub-shrub and mixed coniferous species along shoreline areas. The development of new campus vistas or pedestrian viewpoints could be designed to not compromise opportunities to revegetate shoreline areas.
- Shoreline areas could be enhanced or restored through the retention or placement of shoreline-associated large woody debris for cover and forage production.

### Unavoidable Adverse Impacts

Significant unavoidable adverse impacts could occur along shoreline areas, affecting aquatic habitat areas, if planned development does not mitigate for disturbance. The increase in stormwater runoff volumes from new development could exacerbate water quality problems, thus affecting fish habitat. New development could permanently displace some existing terrestrial habitat.