

**Keeneland Park Project
A Planned Rural Residential Development
Final Habitat Management Plan**

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Executive Summary

The Keeneland Park project is proposed as a Planned Rural Residential Development (PRRD) to subdivide a 315-acre parcel in rural Thurston County into 99 single-family residential lots and one 269-acre Resource Use Parcel. Residential lots will be clustered into two areas encompassing 46 acres on the east portion of the site. Other project elements include roads, utilities, and stormwater management facilities. The Resource Use Parcel includes an agricultural tract and a preservation area that includes sensitive critical areas. Existing agricultural uses including hay production and grazing will continue on 81.5 acres (agricultural tract), while existing wetlands, streams, and associated buffers will be protected on the remaining 187.5 acres of the Resource Use Parcel .

This Habitat Management Plan (HMP) has been prepared to support development of the Keeneland Park project. A great blue heron (*Ardea herodias*) rookery and an osprey (*Pandion haliaetu*) nest were identified immediately north of the project site. Bald eagles (*Haliaeetus leucocephalus*) have also been observed in the vicinity of the osprey nest and heron rookery for the past several years and may nest at this offsite location in the future. This HMP has been prepared to address potential impacts to great blue heron and osprey, which are both considered state monitor species. In the event that bald eagles nest at this offsite location in the future, this HMP also includes mitigation measures prepared in consultation with WDFW and presented in the site-specific bald eagle management plan prepared by WDFW for this project (WDFW, 2008). This final HMP covers the information required to meet the special report requirements for habitat management plans as required by Thurston County Code (TCC) 17.15.735. This HMP was developed in consultation with the Washington State Department of Fish and Wildlife (WDFW).

A 600-foot buffer has been designated around the active rookery and osprey nest that restricts all development year-round. A 1,000-foot buffer has also been designated around the rookery that restricts construction between 600 feet and 1000 feet from the rookery between February 15 and June 30, to limit impacts to nesting great blue heron. Heron nesting activity will be monitored before and during construction to determine whether restrictions within 1,000 feet are required during construction.

No specific mitigation measures are proposed for the osprey nest located within the great blue heron colony because there are no current WDFW management recommendations for this species (Davis, 2006). However, many of the mitigation measures proposed for the great blue heron will also serve to protect the osprey nest from disturbance.

Mitigation measures for the potential bald eagle nest have been developed in consultation with WDFW to meet the requirements of the Bald Eagle Protection Act (RCW 77.12.655) and the Bald Eagle Protection Rules (WAC

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232-12-292). A bald eagle site management plan has been prepared by WDFW for protecting the potential eagle nest located near Keeneland Park on the adjacent Elwanger project (WDFW, 2008). Mitigation measures described in the plan prepared by WDFW are included in this HMP prepared for Keeneland Park.

I. Introduction

This Habitat Management Plan (HMP) has been prepared to support development of the Keeneland Park project. An active great blue heron (*ardea herodias*) rookery and an osprey (*pandion haliaetu*) nest were identified north of the project site. This HMP has been prepared to address potential impacts to both of these species, which are both considered state monitor species. This final HMP covers the information required to meet the special report requirements for habitat management plans as required by Thurston County Code (TCC) 17.15.735. This HMP was developed based on guidance from the Washington State Department of Fish and Wildlife (WDFW).

A. Project Description

The Keeneland Park project is proposed as a Planned Rural Residential Development (PRRD) to subdivide a 315-acre parcel in rural Thurston County (Figure 1 Vicinity Map) into 99 single-family residential lots and one 269-acre Resource Use Parcel (Figure 2). Residential lots will be clustered into two areas encompassing 46 acres on the east portion of the site. Other project elements include roads, utilities, and stormwater management facilities. The Resource Use Parcel includes an agricultural tract and a preservation area that includes critical areas (Figure 2). Existing agricultural uses including hay production and grazing will continue on 81.5 acres (agricultural tract), while existing wetlands, streams, and associated buffers will be protected on the remaining 187.5 acres of the Resource Use Parcel. The Resource Use Parcel will continue to be owned and managed by Hansen/LUFCO LLC.

B. Site Description

The Keeneland Park site was operated as a dairy farm until 2000. From at least 1953 through 1980, Ayer Creek was channelized and ditches were used to drain site wetlands for agricultural production and grazing (Figures 3, 4, and 5). By 1996, beaver dams created large open water/aquatic bed areas across the central portion of the site along Ayer Creek (Figure 6; Skillings, 2006) (Photo 1). Upland and wetland pasture areas are present throughout the site (Photos 2 and 3). Sand and gravel mining has also occurred in recent years on the southeast portion of the site (Photo 4). Forested areas were logged sometime between 1980 and 1996 (Figures 5 and 6, Photo 5).

Onsite springs and wetlands form the headwaters of Ayer Creek (Skillings, 2006). Ayer Creek flows north through the center of the site (Photo 6) and into the Deschutes River approximately 900 feet north of the site. Spring, summer, and fall Chinook salmon are recorded as being observed in Ayer Creek. Elwanger Creek, a tributary to Ayer Creek (Figure 6), is a type 3 stream located on the western central portion of the Property. One large wetland area (Wetland A), which includes palustrine emergent, open water, and scrub-shrub habitats, is associated with Ayer Creek (Photos 1, 3, 6, and 7). Several smaller wetlands (Photo 8) are found in glacial kettles and small depressions across the site (Figures 7 and 8).

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II. Study Methods

Skillings Connolly biologists surveyed the site for wetlands (potential heron foraging areas), plants, and other wildlife habitat and species. Site visits were conducting as detailed in Table 1.

Table 1 Skillings Connolly Field Survey Dates

Survey Type ^a	Field Dates
Wetlands	December 12, 15, 17, 18, 19, 20, 22, 23, 29 and 31, 2004 and January 5, 13, and 21, 2005
Plant communities and unique plants	September 1 and October 7, 2004, June 29 and July 13, 2005
Wildlife habitat and species	August 12 and 25, September 1, October 7, 10 and 11, December 15, 17, 18, 23, 29 and 31 2004 and February 23 and June 21, 2006
Great blue heron, osprey, and bald eagle	August 12 and 25, September 1, October 7, 10 and 11 2004, June 29, July 1, and July 7, 2005; May 3 and 5 and June 21, 2006; June 20 and 21, 2007
Mazama (western) pocket gopher	October 7 and 10, 2004
State priority butterflies	June 29, July 1, 5 and 7, 2005

a) Field surveys completed by Mike McGinnis or Patrick Skillings (Skillings Connolly)

Mike McGinnis, a Senior Biologist with Skillings Connolly, surveyed the site and the great blue heron colony located offsite (active colony) with Washington State Department of Fish and Wildlife (WDFW) biologists on September 1, 2004 (Debbie Carnevali) and on June 21, 2006 (Jeff Davis). The Draft Keeneland Park HMP (Skillings Connolly 2005), was developed based on guidance from WDFW resulting from the September 1, 2004 site visit concerning site-specific mitigation measures that included buffer zone widths for protecting the active great blue heron colony (Skillings, 2006; McGinnis, 2006).

Linda Krippner, a Senior Scientist with ESA Adolfson, conducted a site visit on August 28, 2006 with Mike McGinnis (McGinnis, 2006), and a field survey on October 19 and 20, 2006. During Adolfson's field survey in October, different habitats on the site were evaluated by walking representative habitat areas, proposed development areas, and the offsite heron colony and osprey nest location. Adolfson used Skillings Connolly's wetland delineation results (Skillings 2006) and a 2003 aerial photograph to identify habitat areas and to estimate project impacts to these habitat areas (Figures 7 and 8). An update to the Draft Keeneland Park HMP (Adolfson 2006) was prepared with guidance from WDFW (Davis, 2006) with regard to the proposed mitigation measures.

III. Findings

Wetlands are a prominent feature on the project site, encompassing approximately one-third or 105 acres of the site (McGinnis, 2006). Upland forested areas comprise approximately 44 acres of the site, and the remaining acreage (166 acres) is made up of agricultural fields, upland pasture, and developed areas including historic homes, a barn, and roads. The dominant habitat types present are upland pasture (Photo 1) and palustrine emergent habitat (approximately 78 acres) (Figure 3, Photo 3). Deciduous trees, mainly big leaf maple (*acer macrophyllum*), are distributed in patches throughout the pasture areas (Photo 2). Palustrine scrub-shrub (approximately 20 acres) (Photos 7 and 8) and palustrine open water/aquatic bed (approximately 7 acres) (Photo 1) habitat are also present in the central portions of the site and extend to the north and south site boundaries (Figure 8). Reed canarygrass (*phalaris arundinacea*) is the dominant plant species in emergent wetland habitats, while Douglas spiraea (*spirea douglasii*) and willows (*salix spp.*) are dominant plant species in scrub-shrub wetland habitats. Wetlands B and E, which are categorized as low elevation sphagnum peat bogs, are also dominated by Douglas spiraea and Labrador tea (*ledum groenlandicum*).

The largest area of upland forest is found near the northwest site boundary, extending offsite to the Deschutes River. Since upland forest areas have been logged historically, dominant trees are primarily red alder (*alnus rubra*) and big leaf maple. Young red alder stands are prevalent in the northwest (Photo 5) and southeast portions of the site. Douglas fir, western red cedar (*thuja plicata*), and big leaf maple are also present in some of the forest stands (Photo 9).

Habitat diversity is high providing habitat for a variety of wildlife species. Common bird species observed on the site include Steller's jay (*cuanoatta stelleri*), spotted towhee (*pipilo maculatus*), black-capped chickadee (*poecile atricapilla*), Pacific slope flycatcher (*empidonax difficilis*), barn swallow (*hirundo rustica*), violet-green swallow (*tachycineta thalassina*), red-breasted nuthatch (*sitta canadensis*), northern flicker (*colaptes auratus*), American robin (*turdus migratorius*), American goldfinch (*carduelis tristis*), pileated woodpecker (*dryocopus pileatus*), red-tailed hawk (*buteo jamaicensis*), osprey, great blue heron, and green heron (*butorides virescens*). Waterfowl species are attracted to the large, seasonally inundated pastures. Up to 200 American widgeon (*mareca americana*) forage on the grazed pasture areas in winter (McGinnis, 2006; Krippner, 2006).

Numerous wildlife trails, especially for black-tailed deer (*Odocoileus hemionu*), were observed as were beaver (*Castor canadensis*) that have created open water ponds on the site (Skillings, 2006). Other common mammals include eastern gray squirrel (*Sciurus carolinensis*), raccoon (*procyon hemionus*), Virginia opossum (*didelphis virginiana*), and numerous mice and voles. Amphibians observed included red-legged frog (*rana aurora*), bullfrog (*rana catesbiana*), and Pacific tree frog (*rana clamitans*).

A. Great Blue Heron and Osprey Nesting

Two great blue heron nesting rookeries (heronries) have been identified; one heronry is located onsite while the other is located offsite to the north (Figure 2). These two great blue heron rookeries each contain less than 10 nests and have not been monitored on a regular basis during any year.

At the onsite heronry (abandoned), a total of nine nests were observed in a stand of dead Oregon ash (*fraxinus latifolia*) trees, adjacent to Ayer Creek (McGinnis, August 12, 2004). No signs of nesting activity were observed in 2004 at this onsite heronry and no nesting activity has been recorded since that time (McGinnis, 2006). As of late 2006, the majority of observed nests are gone, having been damaged by winter storms.

The offsite great blue heron rookery (active) is located in Oregon ash and Douglas fir (*pseudotsuga menziesii*) trees adjacent to open water components of the main wetland complex; approximately 200 feet north of the project site (Photos 10 and 11). An osprey nest is also located near the top of a Douglas fir within the active heronry (Photos 10 and 11). The great blue heron colony has been active since at least 2004 (Skillings, 2006). Three great blue heron nests were active in May and June 2006 (Skillings, 2006).

At the offsite rookery in October 2006, Adolfson staff observed two heron nests in the Douglas fir that is also occupied by the osprey nest. Four additional heron nests were observed in the Oregon ash trees adjacent to the Douglas fir. The Douglas fir tree is leaning towards the water, the root system is likely affected by surface and ground water levels that have risen in recent years adjacent to this side of the tree. The Oregon ash trees are partially dead, possibly having been affected by rising water levels as well. Other large trees in the area of the active heronry have suffered mortality, a few of which have fallen into the wetland area in recent years, indicating that trees in this area are vulnerable to the relatively new high water levels in this area (Photo 12). The osprey nest was occupied during the August 28, 2006 site visit. However, no heron nests were occupied at this time, as would be expected in late August and October.

Skillings Connolly conducted a survey of the heron rookery and osprey nest area on June 20 and 21, 2007 and observed no nesting activity by great blue heron or osprey. However, a neighbor living adjacent to the site reported that the osprey nest was active earlier in June 2007.

Other potential nesting habitat for great blue heron and osprey is located between the existing nests and the Deschutes River (Figure 8). Potential nesting habitat for great blue heron and osprey on the site is limited to approximately 3 acres of mixed deciduous-conifer forest near the center of the site and adjacent to Wetland A (Photo 9).

B. Bald Eagle Activities

Bald eagles (*Haliaeetus leucocephalus*) have been observed in the vicinity of the osprey nest and heron rookery for the past several years and may nest at this off-site location in the future. A pair of bald eagles was observed in this area by Skillings Connolly in June 2007, but no bald eagle nesting activity was observed during these survey days. Also in 2007, WDFW biologists observed early season activity in March and late season bald eagle breeding activity on July 19, 2007 at the location of the previously identified osprey nest (WDFW, 2008).

C. Foraging Habitats

Foraging habitats surrounding the great blue heron colony (active 2006) and osprey nest are extensive, encompassing open water/aquatic bed and emergent habitats in Wetland A and the Deschutes River floodplain (Photos 1, 3, 12, and 13). Foraging areas for great blue heron, osprey, and bald eagle have likely been increasing in recent years due to cessation of hydrology modification associated with agricultural activities (e.g. beaver control, ditching) that has resulted in larger open water/aquatic bed habitats (Figures 3 through 8). Beaver activities have also contributed to the increase in foraging areas for great blue heron in the central portion of the site.

D. Human Activities in the Vicinity of the Nesting Colony

Human activities close to the active heron colony and osprey nest include those related to the existing residential homes 400 feet north of the colony (Riverlea Subdivision, ca. 1975) and a trail 300 feet north of the colony (Figure 8, Photos 14 and 15). Aircraft from the nearby Olympia airport fly over at less than 1,000 feet altitude during take-off and landing (Skillings, 2006). The osprey nest is visible from the trail, but heron nests are concealed by vegetation, even in late October.

IV. Project Impacts

A. Site Vegetation

Approximately 46 acres of pasture, including scattered trees and forest patches (approximately four acres of forest total), will be developed into two single-family residential cluster communities (Figures 2 and 8). The upland pasture communities to be lost are dominated by orchard grass (*dactylis glomerata*), tall fescue (*festuca aruninacea*), quack grass (*agropyron repens*), Canada thistle (*cirsium arvense*), and other grasses and herbs. Small patches of forest on the periphery of the two residential cluster areas, including forest surrounding two unregulated wetland areas will likely be cleared for the development (Figure 8) (Photo 8). Scattered deciduous trees, mainly big leaf maple, are also present in the north cluster and would likely be cleared for the residential development (Photo 5).

Areas dominated by grasses in the agricultural tract will continue to be maintained as pasture or used for hay production. Approximately 6.5 acres of upland forest habitat within the agricultural tracts may continue to be logged

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(Figure 8). Several small depressional wetlands are located in the agricultural tracts, only one of these wetlands, Wetland G, meets the regulatory definition of a wetland, based on the Thurston County Critical Area Ordinance. Upon project approval, Wetland G and its associated buffer will be considered part of the preservation area and will no longer be used for agricultural purposes.

The 187.5-acre preservation area is included in the Resource Use Parcel, which is designated as a condition of the PRRD. No agricultural or development activities will occur in the preservation area (Figure 2). Upland forest areas (approximately 33 acres) are expected to mature, and wetland habitats (approximately 104 acres) are likely to change over time as they have in recent years with beaver activities and the cessation of the dairy operation.

No unique plant species were observed by Skillings Connolly biologists (2006) during rare plant surveys, therefore no impacts to unique or rare plant species are anticipated. Due to the fact that upland and wetland habitats on the Property have been relatively disturbed by historical agricultural activities and logging and are dominated by invasive plants such as reed canary grass, rare plants are unlikely to be present in these areas.

B. Wildlife Species

The loss of approximately 46 acres of upland pasture, scattered trees and shrubs, and two small scrub-shrub wetland areas (non-regulatory wetlands) will result in a loss of potential nesting and foraging habitat and cover for birds such as American robin, American goldfinch, house finch, black-capped chickadee, and Steller's jay and mammals such as moles, voles, mice, rats, Virginia opossum, and raccoon. Foraging habitat for raptors such as red-tailed hawk and barn owl will also be lost. No loss of foraging habitat for osprey is anticipated as a result of this project because habitat for their fish prey (streams and open water wetlands) will be protected within the preservation area. Upland pasture does occasionally provide foraging opportunities for great blue heron as they will forage on small mammals and amphibians found in these habitat areas. However, great blue heron forage much more frequently in shallow water and emergent wetland areas and these areas provide much greater prey abundance than upland pasture areas. In and around Wetlands C and D and the small portion of Wetland A to be developed, breeding and dispersal habitat for amphibians such as Pacific tree frog will also be lost.

Movement corridors for mammals such as black-tailed deer that currently traverse the north and south cluster development areas will be disrupted by the development. These species are likely to continue to move through the site through the preservation area and agricultural tract.

Construction noise and activities may also disturb nesting or foraging animals in the areas surrounding the cluster developments or the connector road.

Erosion and sedimentation may occur during construction unless temporary erosion and sediment control measures are employed.

Approximately nine acres of new impervious surfaces will be created for the development of the residential clusters. Stormwater runoff from these surfaces may affect the hydrology or water quality of receiving wetlands or streams unless permanent stormwater and water quality facilities are constructed and function properly. Impervious surfaces can increase peak stormwater flows into wetlands and streams, altering the hydroperiod of these systems. Oils and other contaminants from new roadways can pollute stormwater runoff that flows into these systems as well. Wetlands are particularly sensitive to changes in hydroperiod and roadway pollutants.

C. Nesting Habitat

The scattered big leaf maples and young forest patches that will be cleared for the development are unlikely to provide nesting habitat for great blue heron, osprey, or bald eagle due to their limited age, height, and exposure. The sites of the osprey/potential bald eagle nest and the great blue heron rookeries (active in 2006 and inactive) will be protected from development. No potential nesting habitat for great blue heron, osprey, or bald eagle is expected to be lost as a result of this project.

V. Mitigation

A. Mitigation Measures

The mitigation measures described below are designed to protect the onsite habitats and species. In addition, these measures will afford protection to the offsite great blue heron colony and the osprey nest/potential bald eagle nest. The mitigation measures for the great blue heron colony have been developed on a site-specific basis in consultation with the WDFW habitat biologist for this project site (Davis, 2006) and are based on WDFW management recommendations (Quinn and Milner, 1999). No specific mitigation measures are proposed for the osprey nest located within the great blue heron colony because there are no current WDFW management recommendations for this species (Davis, 2006), however, many of the mitigation measures proposed for the great blue heron will also serve to protect the osprey nest from disturbance.

Mitigation measures for the potential bald eagle nest have been developed in consultation with WDFW to meet the requirements of the Bald Eagle Protection Act (RCW 77.12.655) and the Bald Eagle Protection Rules (WAC 232-12-292). A separate bald eagle site management plan has been prepared by WDFW for protecting the potential eagle nest located near Keeneland Park on the adjacent Elwanger project (WDFW, 2008). Mitigation measures described in this plan prepared by WDFW are also included here.

B. Habitat Protection / Clustering of Residential Development

Residential homes will be clustered into two areas on the east side of the site. The total area to be developed into residential lots is 46 acres and consists mainly of upland pasture. The remaining area including large wetland areas and streams will be protected as a Resource Use Parcel consisting of a preservation area (187.5 acres) and an agricultural tract (81.5 acres). Grazing and other agricultural activities will continue as they have since at least 1953 on the agricultural tracts (Figure 3).

Potential nesting habitat for great blue heron on the site will be protected in the preservation area. This potential nesting habitat is currently limited to approximately three acres of mixed deciduous-conifer forest (Photo 7) adjacent to the Ayer Creek wetland (Wetland A), however other forest habitat in the preservation area could provide nesting habitat in the future as the timber matures. Additional areas that may mature as forested wetland may also provide nesting habitat in the future. Though nesting habitat is currently limited on the site, the long-term prospect for this site to be used by great blue heron for nesting is good, given the long-term protection of the preservation area. The inactive heronry is unlikely to be used again for heron nesting because the trees have died.

High quality foraging areas for great blue heron and osprey including Ayer Creek, Elwanger Creek, seven acres of open water/aquatic bed, and 77 acres of emergent wetland habitat will be protected within the preservation area.

C. Bald Eagle Management Zones - Tree and Vegetation Retention

Bald eagle regulations apply two management zones for buffering nest sites from human activities. Bald Eagle Management Zone 1 is located within 400 feet of the nest and Bald Eagle Management Zone 2 is located 400 feet to 800 feet distant from the nest. These management zones are shown on Figure 9. No project activities will occur within Management Zone 1 and tree retention measures will be applied within Management Zone 2.

All native vegetation including large conifers will be retained within 600 feet of the potential bald eagle nest for the Keeneland project site development. No conifer or cottonwood trees within 800 feet of the nest will be removed. Tree removal between 600 feet and 800 feet of the nest is limited to three large bigleaf maple trees.

D. Heron Colony Buffer Zone Protection and Enhancement

Human activities, including residential development, will be restricted within 600 feet of the active heron colony and osprey nest (Figure 8). This 600-foot buffer zone is designated as a permanent protection area where no development will be allowed and access will be limited.

The forested buffer located adjacent to the north cluster development (Photo 17) slopes steeply down to the Ayer Creek wetland (Wetland A). This buffer is vegetated with deciduous trees. These trees are not tall enough, due in

part to the slope, to provide a visual barrier between the north cluster development and the active heron colony and osprey nest. The nests are approximately 40 feet higher than the top of the slope and western edge of the north cluster development. Buffer enhancement is proposed in the buffer area between the north cluster development and the wetland in order to provide future visual screening for the heron colony located across the Ayer Creek valley. The proposed buffer enhancement area is shown on Figure 8.

In addition to the buffer enhancement area, homeowners will be encouraged by covenant and the Integrated Pest Management Plan (IPMP) to plant native species to further improve the buffer between the heron colony and the development. Also, outdoor lighting fixtures will be required by covenant to be shielded and of low intensity to reduce glare from the development.

E. Access Limitations

Fencing and signage will be installed along the boundary of the preservation area, along the boundaries of the north cluster in particular to prevent human access to heron habitat. Hansen/LUFCO LLC will be responsible for maintaining the fencing and signage and for ensuring that no alteration to vegetation within the preservation area occurs without written authorization from Thurston County development services department. The fencing will be split rail with additional wire to prevent pets from entering the buffer areas. Sensitive area and no dumping signs will be posted along the fence line.

F. Seasonal Restriction of Construction Activities

A qualified wildlife biologist will monitor the site before and during construction to determine whether great blue heron are nesting within 3,280 feet of the proposed construction activities. This distance of 3,280 feet is the protective buffer width recommended by WDFW in their management guidelines for great blue heron (Quinn and Milner, 1999). At least two days of monitoring will occur before construction activities begin and monitoring will continue at least once per month during construction. Monitoring methods may be adjusted depending upon construction sequencing or observations made during monitoring. Further monitoring findings will be reported to Thurston County, and will include a description of the construction activities and any nesting activities. Thurston County and WDFW will be allowed onsite to conduct independent monitoring prior to and during site development and home construction.

Exterior construction activities including grading, excavation, framing, siding, roofing, etc. will be restricted within the 1,000-foot buffer zone between February 15 and June 30, regardless of the construction monitoring findings if great blue heron are nesting at the active nest location shown in Figure 8. If no herons are nesting the year that construction activities will occur, then seasonal restrictions for construction activities may be lifted by Thurston County and WDFW. However, Thurston County and WDFW will take a precautionary approach to protecting wildlife habitat and may choose to restrict outdoor construction within the 1,000-foot buffer zone between

February 15 and June 30 regardless of the monitoring findings.. This 1,000-foot buffer zone for restricting construction activities during the nesting season was designated for the Keeneland Park site in consultation with WDFW biologists (McGinnis, 2006; Davis, 2006). Construction activities in the north cluster may occur outside of the 1,000-foot buffer zone as long as no disturbances to heron nesting or nearby foraging are recorded during construction monitoring.

H. Wetland Hydrology and Water Quality Protection

Wetland hydrology and water quality will be protected with a temporary erosion and sediment control plan (TESC) during construction and permanent stormwater facilities post construction in accordance with the Drainage Design and Erosion Control Manual for Thurston Region (Thurston County, 1994). A TESC plan will be employed to prevent erosion and sedimentation from negatively affecting adjacent habitat areas. Permanent stormwater and water quality facilities will be constructed to improve water quality and retain stormwater before runoff flows to onsite wetlands and streams. Biofiltration swales, modified oil/water separators, infiltration, and dispersion trenches will be used to improve water quality (Skillings, 2006). Stormwater collection facilities will be designed to release stormwater to uplands at a rate that matches pre-development conditions. Stormwater facilities will be constructed outside of critical area buffers.

A Manure Management Plan has been prepared for continued grazing operations on the agricultural tracts and to maintain water quality on the site.

I. Wildlife Corridor between Wetlands

A 10-foot wide vegetated corridor (Figure 9) will be designated between the Elwanger and Keeneland projects (five feet wide on either side of the property line) to provide a vegetated connection between Wetlands A and B (Figure 7) on both project sites. Animals most likely to use this corridor include small mammals, passerine birds, amphibians, and reptiles. The corridor area will be identified by interpretive signs posted one per lot and will be protected as a title condition on individual lots on both projects; conditions will require that a native plant community be maintained in this corridor area. These conditions will be enforced by the homeowner's association as part of the Covenants, Conditions, and Restrictions (CC&Rs).

J. Pet Waste Stations

At least two pet waste stations will be installed along interior roadways that are likely to be used by residents for exercising their pets. These waste stations will be placed at street ends that may be used by residents to informally access the Resource Use Parcel. The waste station will include a plastic bag dispenser, a plastic-lined, lidded waste container, and signage emphasizing the importance of proper pet waste disposal. Waste stations will be maintained by the homeowner's association.

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K. Enhanced Septic Systems

Enhanced-treatment septic systems will be installed for all homes to decrease nitrogen concentrations in septic effluent. Nitrogen concentrations in septic system effluent are expected to be at least 50% lower than if traditional septic systems are installed (WSP, 2007). In addition, much of this remaining nitrogen is likely to be removed from water as it travels through the soil through the wetland buffer as referenced by WSP (2007). Excess nitrogen in freshwater systems can result in algal blooms and low dissolved oxygen that harm fish and wildlife species. The enhanced septic system would reduce the risk of excess nitrogen from the development reaching wetland habitats.

L. Wetland Buffer Enhancement

If the Proposed Alternative with planned buffer averaging is accepted as proposed, mitigation in the form of buffer enhancement and restoration will be implemented, and nearly 20 acres of current pasture land may be restored to native forested conditions in the area surrounding Elwanger Creek. Enhancement and restoration measures would likely include light earthwork to increase microtopography, native tree and shrub plantings, large wood installation, fencing to exclude livestock, weed control, and other maintenance and monitoring (WSP, 2007). This restoration project would result in improved long-term habitat conditions for a diversity of native species including the species specifically addressed in this HMP: great blue heron, bald eagle, and osprey. Human disturbances should also be limited due to Elwanger Creek's location west of Wetland A (opposite from the residential development) and adjacent to Deschutes River forest habitats (Figure 2).

I. Periodic Review of the HMP

A timetable for periodic review of the HMP for the great blue heron colony and osprey/potential bald eagle nest will be developed with Thurston County, if necessary. No periodic review should be needed unless additional development is proposed for this site in the future. Mitigation measures for the site are designed to protect great blue heron and bald eagle nesting and foraging habitat into the future without periodic review of the HMP.

VI. References

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Skillings Connolly Environmental. 2006. *Keeneland Park Planned Rural Residential Development (PRRD) Draft Environmental Impact Statement (DEIS)*. Thurston County, Washington.

Skillings Connolly Environmental. 2006. *Keeneland Park Planned Rural Residential Development (PRRD) Plant, Animal, and Plant Report*. Thurston County, Washington. Mike McGinnis.

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Washington Department of Fish and Wildlife (WDFW). 2006. *Habitats and Species database*.

Washington Department of Fish and Wildlife (WDFW). 2008. *Bald Eagle Site Management Plan for Ayers Creek Bald Eagle Territory #1743*. Prepared for Todd A. Hansen/LUFCO LLC.

WSP Environmental Strategies. 2007. *Comparative Analysis of Wetland Water Quality and Buffer Management Approaches at Keeneland Park*. Technical Memorandum – Revised December 3, 2007.

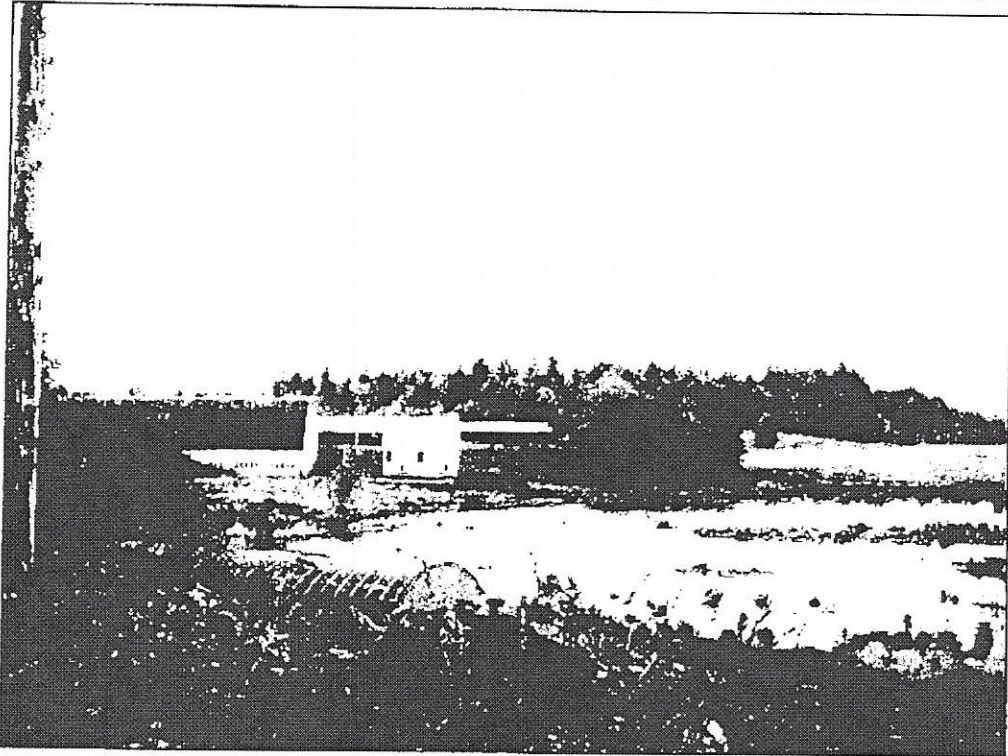


Photo 1. Palustrine open water/aquatic bed and emergent habitat as well as farm buildings on the central portion of the site (10-19-06).

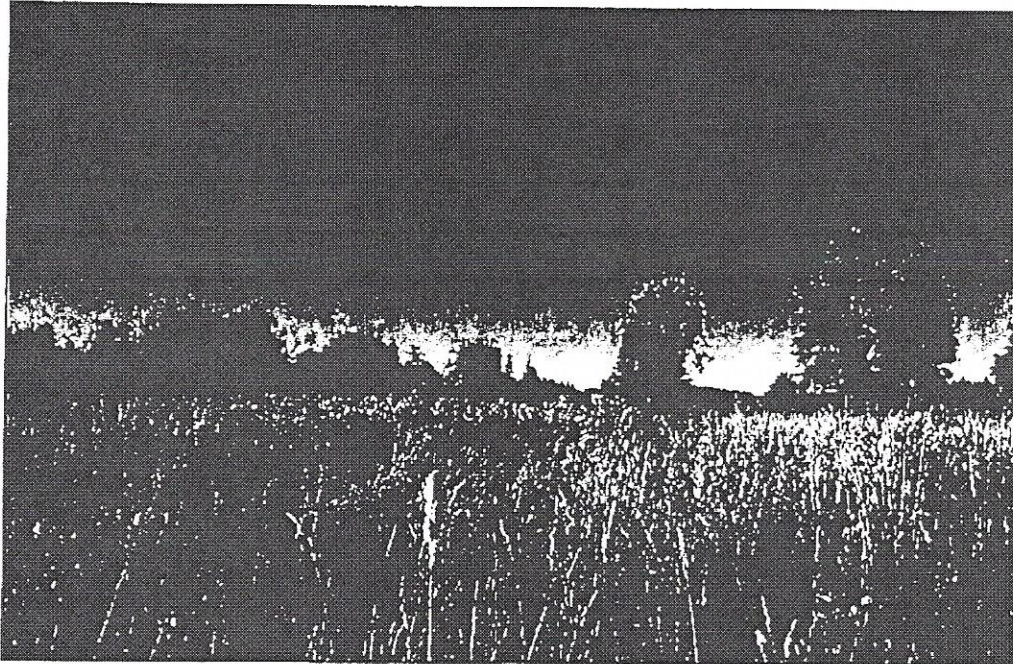


Photo 2. Pasture in the proposed north cluster development area, scattered big leaf maple trees are on the right side of the photo (8-28-06).

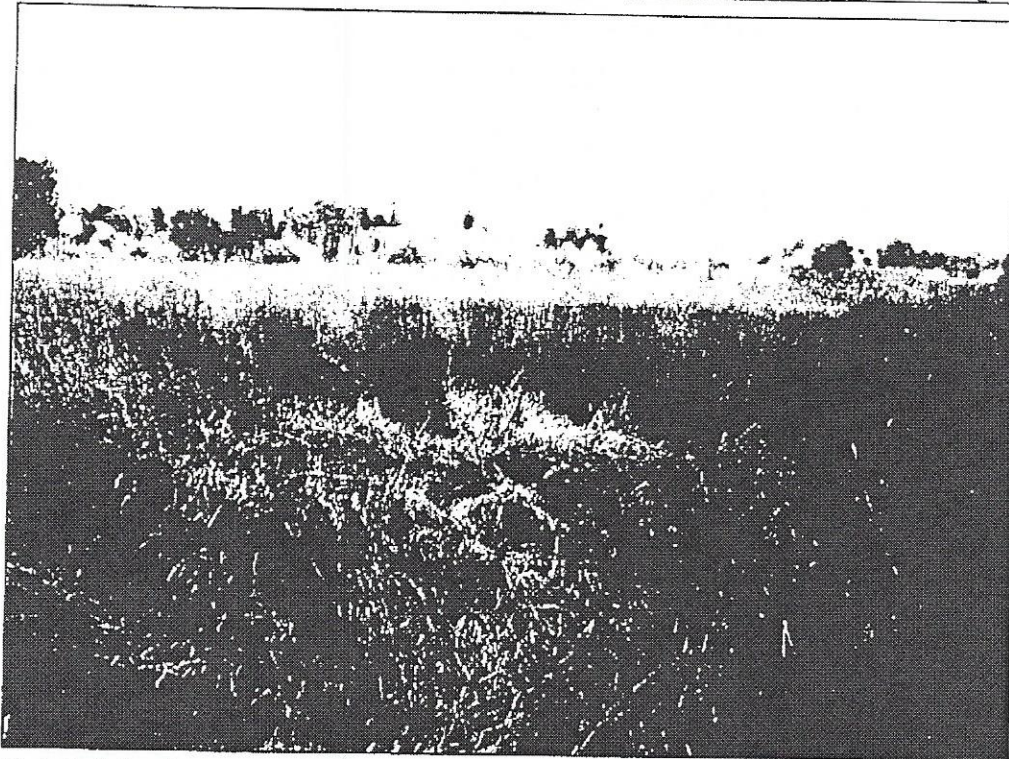


Photo 3. Palustrine emergent habitat on the north portion of the site (10-20-06).

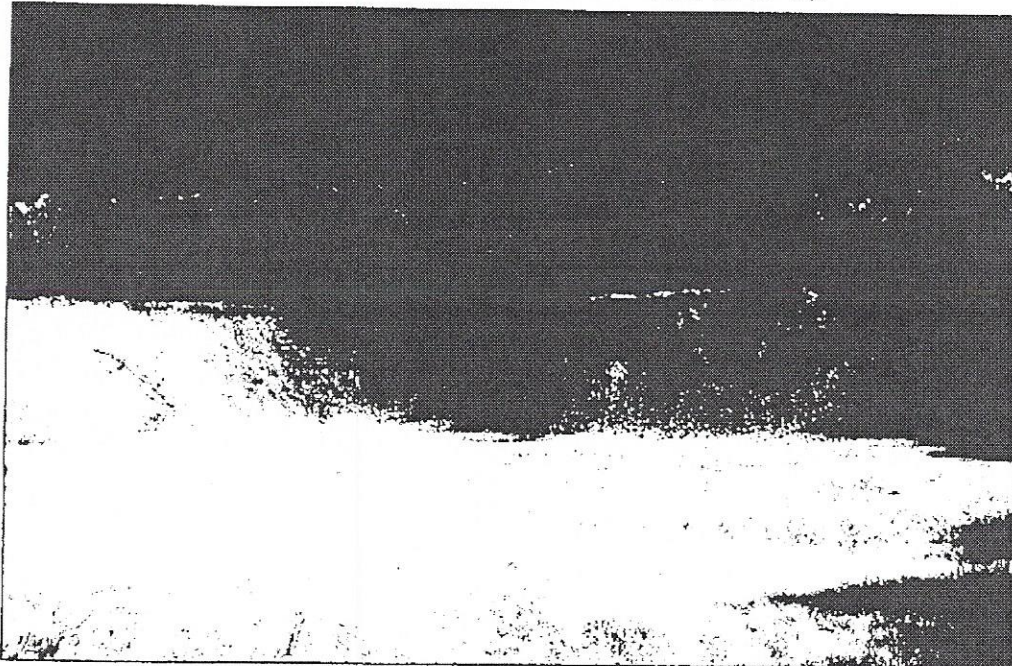


Photo 4. Former gravel pit areas in the proposed south cluster development, red alder saplings are growing above the gravel pit (8-28-06).

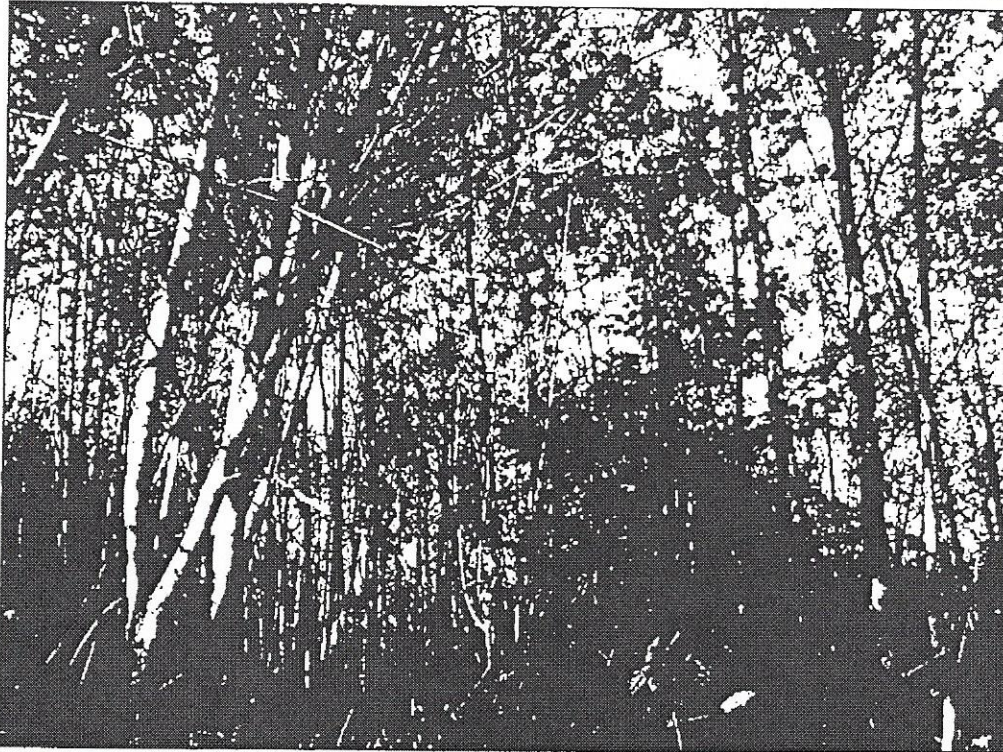


Photo 5. Recently logged area dominated by young red alder trees on the northwest portion of the site (10-20-06).



Photo 6. Ayer Creek, view from a gravel road near the dairy facilities (10-20-06).



Photo 7. Mixed deciduous-conifer stand located adjacent to Wetland A near the center of the site, approximately 3 acres of potential nesting habitat for heron is present here (10-20-06).

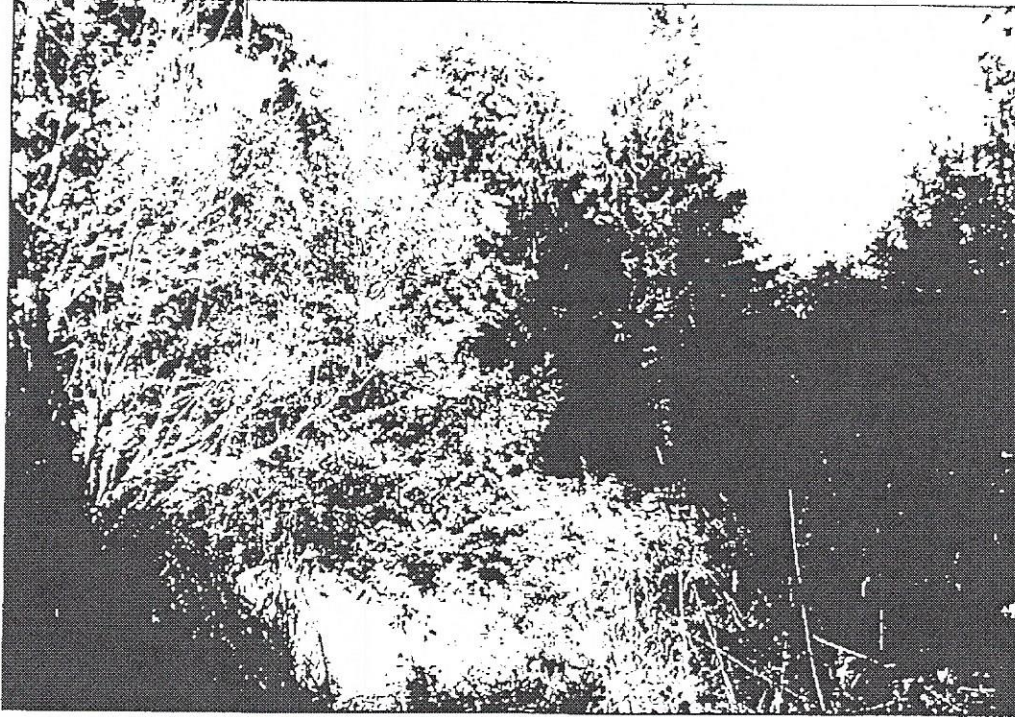


Photo 8. Palustrine scrub-shrub vegetation in Wetland D and its forested buffer (10-19-06).



Photo 9. Palustrine scrub-shrub vegetation in Wetland A (10-19-06).

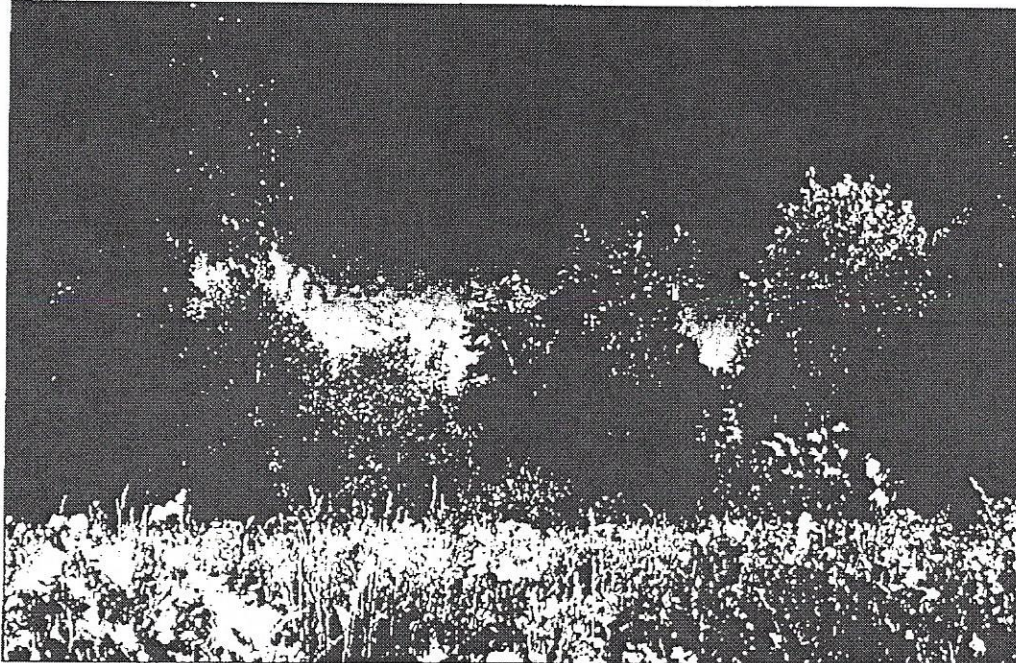


Photo 10. View of osprey nest and great blue heron colony from north cluster area (8-28-06).



Photo 11. Zoomed in view of the osprey nest/heron colony from the north cluster area, heron nests are visible in the Oregon ash trees on the left side of the photo (8-28-06).

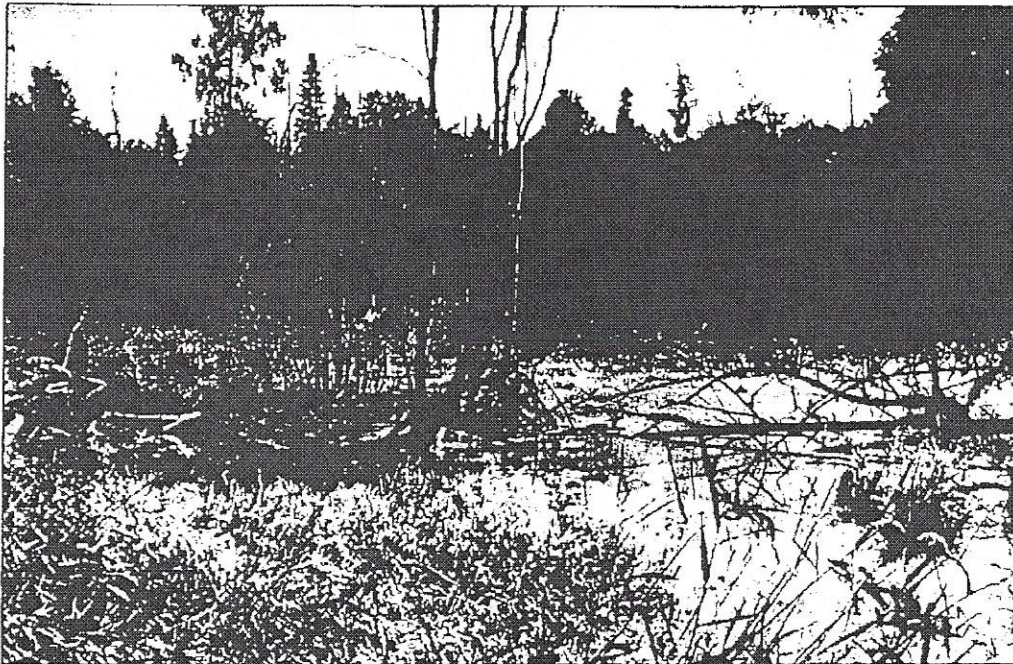


Photo 12. Heron foraging area in Wetland A located offsite, view from heron colony (8-28-06).

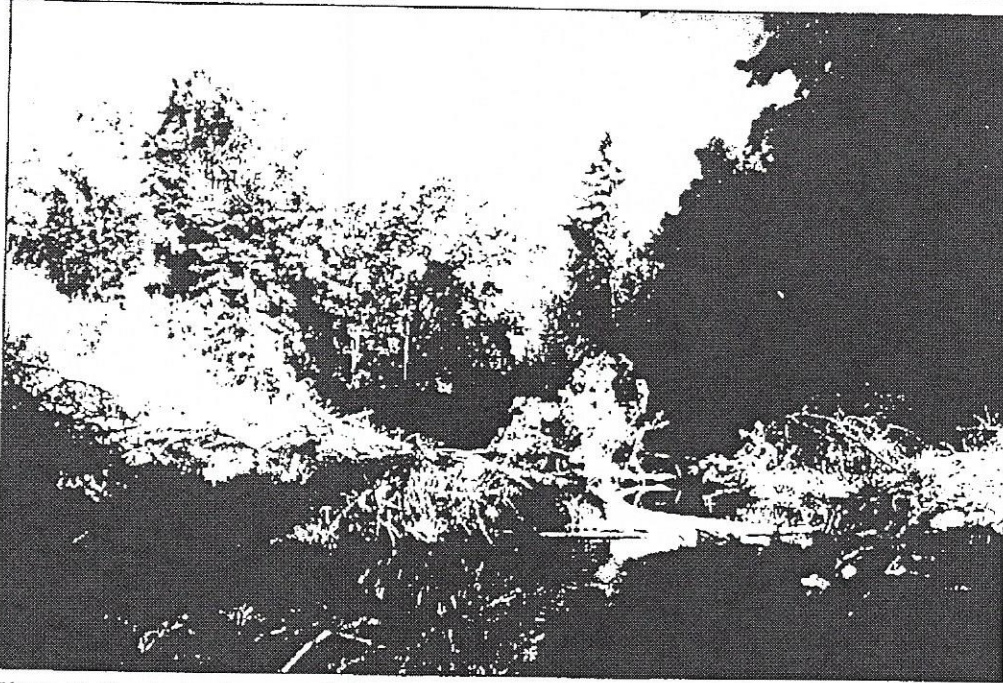


Photo 13. Deschutes river near the heron colony/osprey nest (8-28-06).



Photo 14. House located approximately 400 feet north of the osprey nest/heron colony (8-28-06).

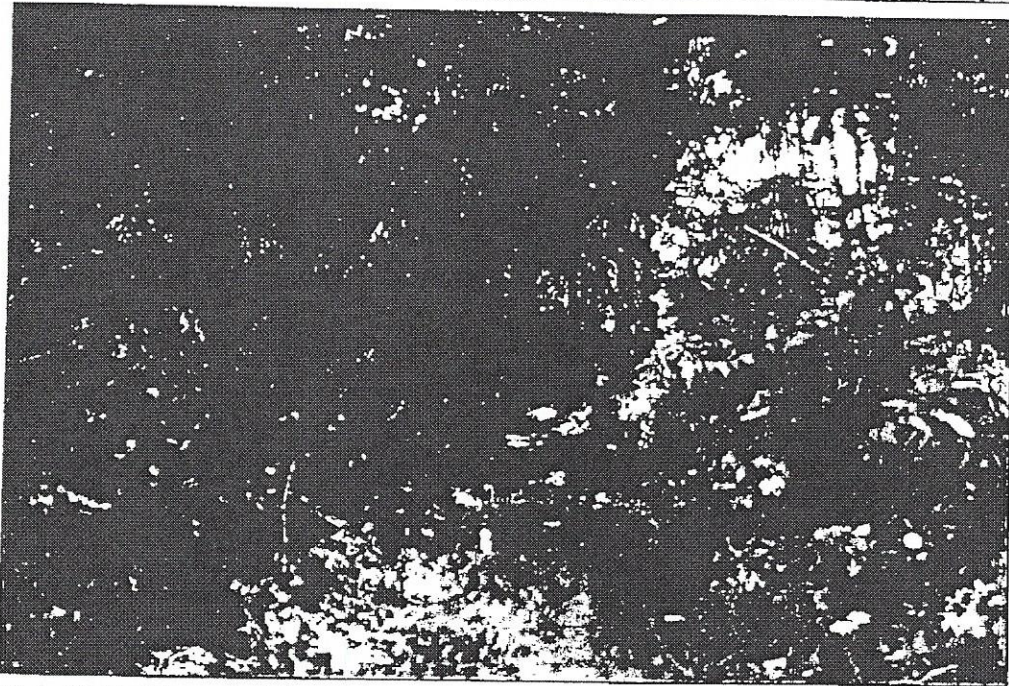


Photo 15. Trail located within 300 feet of the osprey nest/heron colony (8-28-06).

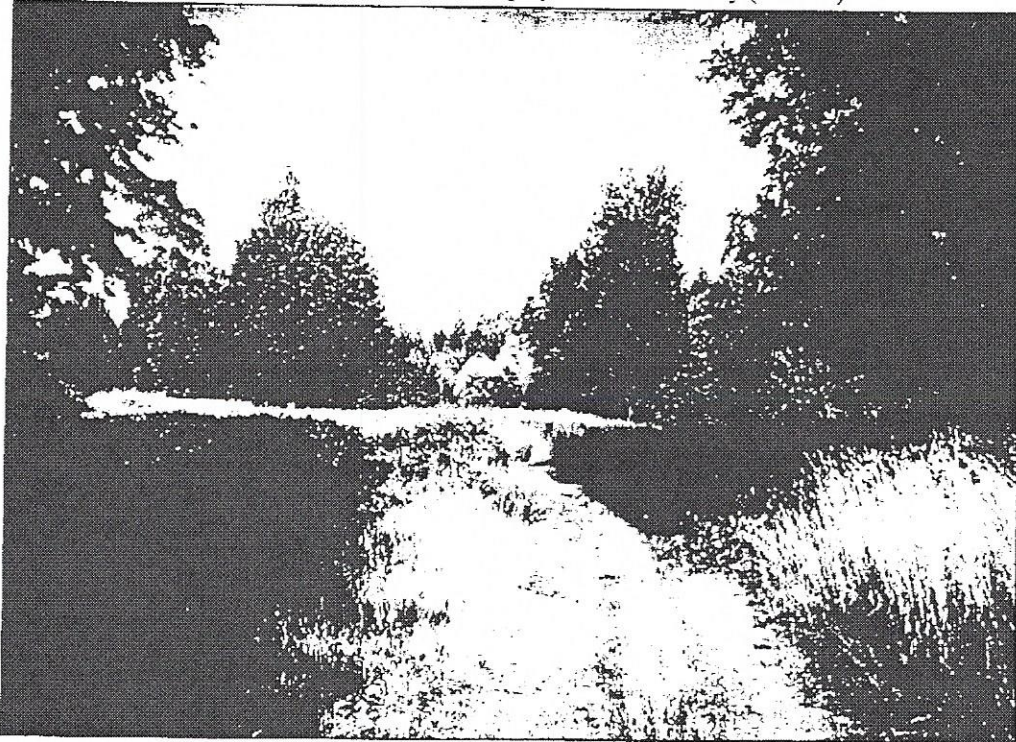


Photo 16. Proposed connector road between the north and south clusters (10-19-06).

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Final Habitat Management Plan



Photo 17. Forested buffer immediately west of the north cluster development (osprey nest and heron colony are visible in the background) (10-19-06).

Skillings Connolly/ESA Adolfson

Final Habitat Management Plan

Appendix A. WDFW Draft Bald Eagle Site Management Plan

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s/be Exhibit B?



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**WASHINGTON DEPARTMENT OF FISH AND WILDLIFE
BALD EAGLE SITE MANAGEMENT PLAN
RCW 77.12.655
WAC 232-12-292**

TERRITORY: *Ayers Creek Bald Eagle Territory #1743*

Applicant

TODD A HANSEN/LUFCO LLC
9300 Kimmie St SW
Olympia, WA, 98512

Property

Parcel #17707300000, 12712440000,
11707310100, 11718320000
11718200000, 11718130000
11718120200, 11707310000
THURSTON COUNTY

PENDING ACTIVITY

The Elwanger PRRD Housing Development proposes to sub-divide 100 acres into two separate land use tracts with 19 residential units on the first 16 acres while leaving 84 acres undeveloped. The Keeneland Park PRRD Housing Development proposes to sub-divide 315 acres into 99 residential units and one 269 acre resource use parcel.

FACTORS CONSIDERED

1) Landowners goals were considered through a review of the habitat management plans for each project with a revised date of January 11, 2007 (Keeneland) and January 9, 2007 (Elwanger); various memorandums and emails providing additional wildlife information for the sites; site visits by Wash Dept Fish and Wildlife (WDFW) wildlife biologists Debbie Carnevali (Sept 2004) and Jeff Davis (June 2006); a site visit by Scott Longanecker (Thurston County Development Services) and Michelle Tirhi (WDFW) on 7/19/07; a planning meeting attended by Michelle Tirhi, Scott Longanecker, Jason Kunz (WDFW), Cindy Wilson (Thurston County Development Services) and Linda Krippner (ESA Adolfson); a planning meeting attended by Michelle Tirhi, Linda Krippner, and Heather Burgess (Todd Hansen Construction) on 12/6/07; email and phone conversations between Michelle Tirhi and Scott Longanecker on final recommendations; and review of various documents regarding both projects submitted by applicant.

Bald Eagle site management plan
Ayers Creek Bald Eagle Territory #1743
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2) Bald eagle use was considered by analysis of territory integrity through time, current surrounding habitat conditions, current status of the population and scientific literature concerning bald eagle habitat protection.

BACKGROUND

Bald Eagle

Osprey initially constructed the nest that is currently being used by the Ayers Creek Bald Eagle pair; the nest was first recorded in the WDFW database in 2004 but could have been active in years previous to that. In March 2007, a WDFW biologist reported the nest now being used by Bald Eagle, which was later confirmed by Michelle Tirhi (WDFW) on 7/19/07.

The Ayers Creek Bald Eagles are an example of a pair that has a nest in an area with low human activity levels in close proximity to the nest but flight paths and foraging areas that bring them close to people on a regular basis. Despite this, subdivision of parcels within 800 ft to ½ mile of the nest tree could lead to human activity levels that cause long-term abandonment of this territory. In addition, future availability of suitable large nesting trees may be limited unless land uses in this area allow for establishment and growth of suitable trees. This plan reflects an emphasis on long-term maintenance of large trees for nesting and additional trees to provide screening vegetation to obscure the nest from view and, possibly, provide future nest trees.

Osprey

Osprey initially constructed the nest that is currently being used by the Ayers Creek Bald Eagle pair; the nest was first recorded in the WDFW database in 2004 but could have been active in years previous to that. In March 2007, a WDFW biologist reported the nest now being used by Bald Eagle, which was later confirmed by Michelle Tirhi (WDFW) on 7/19/07. The Osprey pair has likely moved to another location on or near the property. Biologists should be on alert for a new nest; if one is located, please contact Michelle Tirhi (253-813-8906) for confirmation and recording.

CONDITIONS

The Bald Eagle nesting season is 1 Jan – 15 Aug

Objective 1: To protect Bald Eagles and their habitat, including nesting, perching, screening, and foraging trees.

Bald Eagle site management plan
Ayers Creek Bald Eagle Territory #1743
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- 1) This management plan is being written in conjunction with the Great Blue Heron Site Management Plan for these projects. Please refer to the accompanying Great Blue Heron Site Management and conditions contained within. Osprey (*Pandion haliaetus*) were actively using the currently active Bald Eagle nest tree in 2004, prior to it being taken over by Bald Eagles, and may have been active on the site for several years previous to that based on reports from neighboring landowners. The Bald Eagle site management plan and the Great Blue Heron site management plan in conjunction attempt to reduce impacts to all three species and provide long-term viability at each project site. As such, the applicant and respective agencies have established a 600 ft no use buffer from the Bald Eagle nest to satisfy the needs of Bald Eagles, Great Blue Herons, and Osprey (future potential use of alternative nest tree). This buffer approximates the wetland buffer boundary established onsite (see attachment A).
- 2) Tree cutting, building, road construction, burning, blasting, recreation trails, campsites, and use of heavy machinery are prohibited within this 600 ft wildlife buffer. Human access should also be limited within this buffer.
- 3) Between the 600 ft buffer and 800 ft from the Bald Eagle nest tree, retain all known perch trees and all conifers and cottonwoods ≥ 20 in dbh. Also retain $\geq 50\%$ of pre-clearing or pre-construction conifer stand >12 in dbh. Windowing and low limbing of trees for views is acceptable provided no more than 30% of the live crown is removed.
- 4) Fencing and signage should be installed along the boundary of the wildlife buffer to discourage human and pet access. Thurston County has required the installation of solid fencing (S. Longanecker, pers. comm.). Hansen/LUFCO LLC is responsible for maintaining the fencing and signage and for ensuring that no alteration to vegetation within the preservation area occurs without written authorization from Thurston County Development Services.
- 5) A 10-ft wide vegetated corridor will be designated between the boundary of the Elwanger PRRD Housing Development and the Keeneland Park PRRD Housing Development (5 ft wide on either side of the property line; see attachment A). The intent of this corridor is to provide vegetated connectivity for species movement and security between wetland A and wetland B (see attachments A and C). Animals most likely to use this corridor include small mammals, passerine birds, amphibians, and reptiles. Bald Eagles will benefit from retained trees and vegetation within the corridor. The corridor should be identified by interpretive signs posted one per lot and a native plant community should be maintained in this corridor area.
- 6) The conditions contained within this site management plan should be included as a title condition on individual lots on both projects. These conditions should be enforced as part of the Covenants, Conditions, and Restrictions (CC&Rs).

Bald Eagle site management plan
Ayers Creek Bald Eagle Territory #1743
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*Objective 2: To protect nesting Bald Eagles
from disturbance and prevent possible abandonment*

- 1) The discharge of firearms, fireworks, or explosives should be avoided during the Bald Eagle nesting seasons.
- 2) Grading, timber felling, construction of roads, and the building of homes and other structures is recommended between August 15 and December 31 of any year, especially when Bald Eagles are actively nesting, as evidenced by regular attendance of adults at the nest or the presence of eggs or young in the nest.

DURATION OF PROTECTION

This Plan applies to the landowner(s) who signs the Plan. If the ownership changes, the new owner must sign the Plan or request a new one to reflect a change in land use. Any other land use proposals within the Ayers Creek Bald Eagle Territory, including but not limited to forestry practices, vegetation removal, construction, and changes in major land use activities on the property may be subject to a different set of conditions. It is the landowner's responsibility to notify the WDFW of any new proposed land use activities.

Since eagles return to the same traditional use areas each year, the conditions of this Plan shall apply indefinitely, unless a breeding territory or communal roost has been unoccupied for 5 consecutive years. If a breeding territory or communal roost has been unoccupied for 5 consecutive years, then the WDFW biologist and the landowner should evaluate the continued need for protection of the Bald Eagle habitat. Please contact WDFW if the eagles change the location of their nest. Do not assume that the conditions of this Plan no longer apply.

REVIEW AND AMENDMENT

This Plan will be subject to the following review and amendment procedures. The plan may be reviewed periodically by the WDFW and the landowner to determine whether: 1) the Plan requires amendment in response to changing eagle and landowner circumstances; or 2) the terms of the Plan comply with applicable laws and regulations; or 3) the parties to the Plan are complying with its terms.

DANGER TREES

Except for a tree that presents imminent danger to the safety or property of individuals, a report from a professional arborist, indicating the need to remove the tree, shall be submitted to the WDFW before cutting the danger tree.

Bald Eagle site management plan
Ayers Creek Bald Eagle Territory #1743
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APPEAL PROCEDURE

In addition to the provisions of WAC 232-12-292(7.1)-(7.3), the landowner may request a formal appeal of Department actions in accordance to the Administrative Procedures Act, Chapter 34.05 RCW, and the Model Rules of Procedure, Chapter 10-08 WAC. Such a request shall be filed with the Department within 20 days of receipt of the contested WDFW decision. The appeal request shall clearly state the relief sought and the grounds for the appeal.

COMPLIANCE

Failure to comply with this Plan constitutes a misdemeanor as set forth in RCW 77.15.130.

If the Plan is acceptable, sign and return for WDFW signature.

Landowner or Agent Signature (Date)

Landowner or Agent Names (Print)

Address

City, State, Zip

Region 6 Wildlife Program Director (Date)
Michelle Tirhi 1/9/08

Michelle Tirhi (Date)
District Biologist, Pierce/Thurston Counties

EXHIBIT C

INTEGRATED PEST MANAGEMENT PLAN