

## 2017 ODFW Western Oregon Deer and Elk Habitat

This document summarizes the Oregon Department of Fish and Wildlife's (Department) criteria and rationale for identifying, categorizing, and mapping deer and elk habitat in western Oregon.

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### 1. Overview:

The Department's mission includes managing deer and elk populations at healthy and sustainable levels compatible with the primary uses of the land (ORS 496.012), and bases management decisions on the Oregon Black-tailed Deer Management Plan (ODFW 2008) and Oregon's Elk Management Plan (ODFW 2003). The Department has no direct authority to regulate land uses and must rely on recommendations to a variety of other federal, state and county governments, and private landowners to address habitat needs and/or concerns. Sustainable habitats for deer and elk are considered essential and/or important for their long-term conservation and persistence in western Oregon.

Big game species, such as black-tailed deer and Roosevelt elk, play a critical role in western Oregon's environment, and provide numerous ecological services to our communities. The dietary preferences of ungulates can have a top-down influence on the species of plants that occur in an area (Kay 2009). Browsing and grazing can suppress plant growth (Kay and Bartos 2000), and big game movements play an important role in seed dispersal (Bartuszevige and Endress 2008). These interactions can cascade through an ecosystem causing changes in the composition of bird, insect, and other communities (Martin et al. 2010). By concentrating the energy and nutrients contained in individual plants, ungulates make those resources readily available to their predators, including coyotes, bobcats, black bears, cougars, and Western Oregon's human hunters. The interconnected relationship between plants, ungulates, and predators has been well documented in the literature (Leopold 1943, Binkley et al. 2006, Beschta and Ripple 2009, Beschta and Ripple 2010). In addition to their ecological value, deer

and elk contribute significantly to western Oregon's economy through hunting and wildlife viewing (Dean Runyan and Associates 2009).

## **2. Species:**

This document addresses habitat for two species of deer (Columbian black-tailed deer: *Odocoileus hemionus columbianus* and Columbian white-tailed deer: *Odocoileus virginianus leucurus*) and one species of elk (Roosevelt elk: *Cervus canadensis roosevelti*). Habitat for eastern Oregon deer and elk species, including mule deer, northwest white-tailed deer, Rocky Mountain elk, pronghorns, bighorn sheep, and mountain goats are addressed in the 2013 ODFW Oregon Big Game Winter Habitat (ODFW 2013) document and not in this document.

## **3. Deer and Elk Habitat Descriptions for Western Oregon:**

Deer and elk need habitat which provides a combination of food, water, and security to survive and reproduce. For most black-tailed deer herds, especially in Oregon's Coast Range and urban/rural residential areas, deer make relatively short daily movements and seek out these resources within a relatively small home range (Dasmann and Taber 1956, Miller 1970, Hines 1975, Happe 1982, Bender et al. 2004, ODFW unpublished data 2015). However, black-tailed deer at a number of locations in the Cascade Range have adopted long range migration to maximize access to summer resources and avoid winter shortages (McCullough 1964, Jackson 1999, and McCorquodale 1999). While classification of winter movement strategies as either migratory or resident is useful for conceptualizing animal behavior, there is often no clear line of demarcation separating migratory from non-migratory behavior in nature (Baker 1978), and some deer herds appear to utilize a mixed strategy with both migratory and non-migratory animals in relatively close proximity (Loft 1984, Livezey 1991, ODFW 2015 unpublished). Migratory black-tailed deer and Roosevelt elk display high fidelity to traditional migration routes, and have even been documented swimming reservoirs that bisected their migration routes (Boroski et al 1999, ODFW 1994). The development of migration as an adaptive strategy during the winter season is likely related to the specific evolutionary costs and benefits associated with movement (Nicholson et al 1997, Hynstrom 2008), which may be shaped by the seasonal variability in resources, relative risk of predation during migration, severity of the winter season, and the quality of possibly winter habitat. Whether deer or elk are migratory or residential, they need connectivity between their required resources either within a residential homerange or across the landscape between discreet summer and winter concentration areas.

Habitats supporting black-tailed deer or Roosevelt elk exhibiting a predominately migratory life history are subdivided into Summer Concentration Habitat and Winter Concentration Habitat. Habitats supporting black-tailed deer and Roosevelt elk exhibiting a predominately non-migratory life history are subdivided into Year-around Major Habitat and Year-round Peripheral Habitat. Occupied CWTD habitat is described as likely occupied habitat. Lastly, areas where the presence of deer and elk are considered in conflict with primary land uses are described as Impacted Areas. Specific deer and elk habitat descriptions are as follows:

Occupied CWTD Habitat: Critical, year-round habitats including brushy deciduous trees and shrubs and/or oak savanna habitats providing functions and values necessary to satisfy all

CWTD life history needs. Much of these habitat areas, although impacted by anthropogenic development, are the only remaining available habitat for Columbian White-tailed Deer in Oregon. **Category 2 – essential and limited habitat.**

Winter Concentration Area: Winter seasonal concentration areas include areas identified and mapped as providing essential and limited functions and values (e.g. thermal cover, security from predation and harassment, forage quantity, adequate nutritional quality, escape from disturbance, etc.) for concentrated migratory deer or elk typically from November through April. **Category 2 – essential and limited habitat.**

Summer Concentration Area: Summer seasonal concentration areas include areas identified and mapped as providing essential and limited functions and values (e.g., thermal cover, security from predation and harassment, forage quantity, adequate nutritional quality, calving and fawning areas, etc.) for concentrated migratory deer or elk typically from May through October. **Category 2 – essential and limited habitat.**

Year-round Major Habitat: Year-round major habitat includes areas identified and mapped as providing essential functions and values (e.g., thermal cover, security from predation and harassment, forage quantity, adequate nutritional quality, calving and fawning areas, etc.) for non-migratory deer or elk. However, these essential habitats are typically not limited on a physiographic basis. **Category 3 – essential and not limited habitat or important and limited habitat.**

Year-round Peripheral Habitat: Year-round peripheral habitat includes areas identified and mapped as providing important functions and values (e.g. cover, forage, etc.) for deer or elk. However, these habitats typically do not provide essential functions and values and are occasionally subject to land owner actions to discourage deer and elk use, but are not identified as deer or elk de-emphasis areas. **Category 4 – important and not limited habitat.**

Impacted Area: Impacted areas include areas identified and mapped subject to anthropogenic development such as areas within urban growth boundaries, city limits, otherwise determined to be less suitable habitat for deer or elk because of conflicts with proximity to humans, disease, damage, or public nuisance resulting from use by local or resident deer or elk. Although these areas may support substantial numbers of deer or elk, traditional proactive management actions are often not possible and/or ineffective due to local ordinances and proximity to people. **Impacted areas may still provide habitat functions and values for other fish and wildlife species, but habitat categorization should not be based on deer or elk use.**

#### **4. Habitat Definitions Used to Categorize Deer and Elk Habitats per the Department Fish and Wildlife Habitat Mitigation Policy (OAR 635-415-0000 through 0025):**

Essential Habitat: Any habitat condition or set of habitat conditions which, if diminished in quality or quantity, would result in depletion of a fish and wildlife species.

**Habitat:** The physical and biological conditions within the geographic range of occurrence of a species, extending over time, which affect the welfare of the species or any sub-population or members of the species.

**Important Habitat:** Any habitat recognized as a contributor to sustaining fish and wildlife populations on a physiographic province basis over time.

**Limited Habitat:** An amount of habitat insufficient or barely sufficient to sustain fish and wildlife populations over time.

**Physiographic Province:** Any of one of the ten major geographical areas within the State of Oregon based on differences in topography, climate, and vegetation as defined in the Oregon Wildlife Diversity Plan (OAR 635-100-0001 through 0040).

### 5. Categorization of Deer and Elk Habitat in Western Oregon

Process: Designating fish or wildlife habitats into the appropriate Habitat Category (1-6) requires answering a sequence of yes or no questions, also known as a dichotomous key, ultimately resulting in a specific habitat categorization based on the relative function and value the habitat provides for the species and the relative scarcity of the habitat on the landscape. (Figure 1).

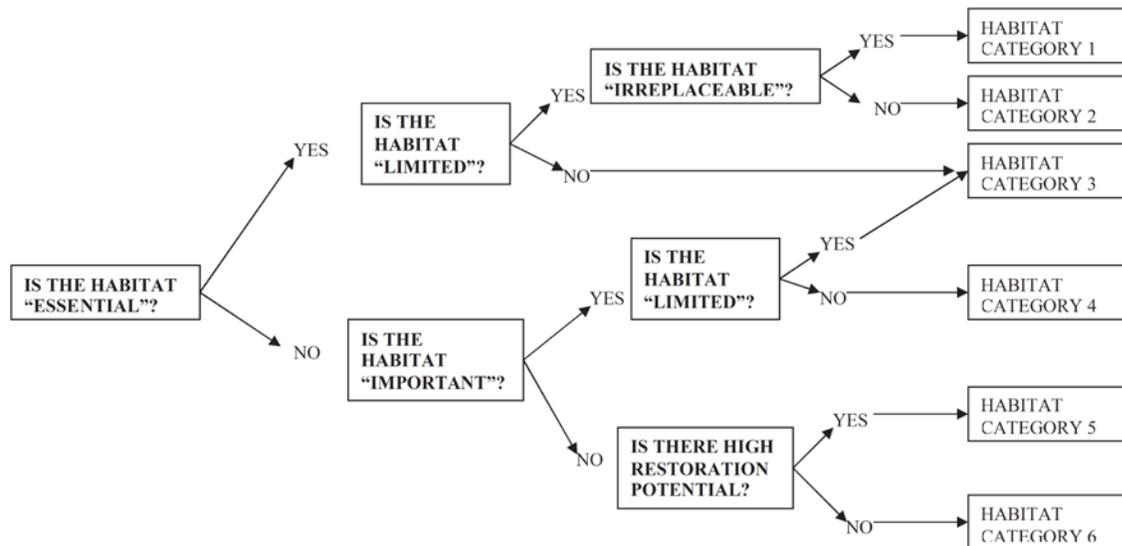


Figure 1. Decision process for identification of habitat function and value relative to habitat category designation.

#### Category 2 Habitat: Occupied Columbian White-tailed Deer Habitat, Summer and Winter Concentration Areas

As defined in the ODFW Fish and Wildlife Habitat Mitigation Policy OAR 635-415-0025(2), "Habitat Category 2" is essential habitat for a fish or wildlife species, population, or

unique assemblage of species and is limited either on a physiographic province or site-specific basis depending on the individual species, population, or unique assemblage.

Step 1: Is the Habitat “Essential”? **Yes.**

“Essential Habitat” means any habitat condition or set of habitat conditions which if diminished in quality or quantity, would result in depletion of a fish or wildlife species.

Summer concentration areas provide essential habitat functions and values (e.g. thermal cover, security from predation and harassment, forage quantity, adequate nutritional quality, escape from disturbance, fawning or calving areas, etc.) to concentrated deer and elk (Cook et al. 1996, Cook 2002, Cook et al. 2011). Functional summer concentration area habitats typically provide the security needed for successful fawning or calving in close proximity to high quality and quantity of nutritional forage. It is this ready access to high quality and quantity forage which allows animals to rebuild adequate fat stores for fall breeding and attaining adequate body condition to survive the following winter period. High quality forage during the summer and early fall contributed to increased mule deer fawn body condition and survival in the winter period (Tollefson et al. 2011). Insufficient levels of energy in forage has been linked to decreased reproduction (Verme 1965) and growth rates in deer fawns (Verme and Ozogo 1980).

Likewise, winter concentration areas provide similar essential habitat functions and values (e.g. thermal cover, security from predation and harassment, forage quantity, adequate nutritional quality, escape from disturbance, etc.) to concentrated deer and elk (Connolly 1981). However, the primary role of functional winter concentration areas is to provide security and access to enough forage to conserve energy and slow the loss of body condition over the winter period.

Periodic severe winters can result in events of high adult mortality known as “winter die-offs” (Brown 1961, Hines 1973). Individuals that survive severe winters may not recover adequate body condition or health to successfully reproduce later that spring or become reproductive again the following fall. Specific deer and elk distribution and patterns in winter concentration areas may vary slightly depending on weather and site specific influences. Depending on the year and conditions within a given year, deer and elk may use certain elevations of winter concentrations areas more than in other years as weather patterns and vegetation abundance vary. During severe winters, lower elevation portions of the winter concentration areas become essential and the only remaining available winter habitat. However, even in mild winters, deer and elk will make seasonal movements up/down slope to take advantage of new plant growth with warmer temperatures at lower elevations, to move out of temporary heavy snow zones and to move out of areas of heavy mud (Dasmann and Taber 1956, Miller 1970). In other areas, deer and elk may be required to make daily up/down slope movement between draws providing cover and areas of accessible forage during colder periods.

The Department has documented deer migration between distinct summer and winter concentration areas in Southwest Oregon (Jackson 1999, ODFW 2015 unpublished), and has

worked with planning departments in Jackson and Josephine Counties to establish winter range protections. On-going telemetry research throughout western Oregon may reveal other summer and winter concentration areas. Maintaining the capacity of summer and winter concentration areas to provide the season-specific resources deer need, and the connectivity between them, will be essential to sustaining healthy deer populations.

Columbian white-tailed deer occupy two very small portions of their historic habitat range in Oregon. The northern population or Columbia River Distinct Population Segment (CR DPS) occupies the less developed portions of the historic lower Columbia River floodplain. The southern population or Douglas County DPS occupy the remaining functional riparian areas and low elevation oak savanna habitats in river valleys and foothills of the Cascade Range in central Douglas County. Because these deer are non-migratory, these habitat areas provide all of the essential habitat functions and values (e.g. thermal cover, security from predation and harassment, forage quantity, adequate nutritional quality, escape from disturbance, fawning or calving areas, etc.) to these last two remaining populations of CWTD in Oregon.

Step 2: Is the Habitat “Limited”? **Yes.**

“Limited Habitat” means an amount insufficient or barely sufficient to sustain fish and wildlife populations over time.

In recent decades summer concentration areas have been significantly affected by changes in forest management, such as aggressive fire suppression methods, reductions in timber harvest on federal lands associated with the Northwest Forest Plan, and increasing use of herbicide on private lands (ODFW 2008). These changes have limited the amount of early seral habitat and associated forage available for black-tailed deer.

Winter concentration areas naturally occur at lower elevations in areas with more private land. These habitats can be close to urban areas, threatened by human development, and subject to aggressive fire suppression efforts. Residential development negatively affects big game by removing habitat, and causing behavioral modifications such as avoidance of dwellings, transition to more nocturnal behavior, and a reduction of home range size (Vogel 1989, Happe 1982). Gucinski et al. (2001) considered roads to be the most damaging feature to the environment in public wildlands management. Human activity on roads can disturb wildlife during the critical winter season, reduce habitat effectiveness by causing big game to avoid well-traveled areas, cause mortality directly through collisions with vehicles (Gaines et al 2003), and provide access to poachers (Stussy 1994, Cole 1997). Gowan et al. (1989) estimated that every mile of forest road eliminated approximately 4 acres of habitat, and an average road density of 3 linear miles per square mile reduced habitat effectiveness by 58%. Numerous authors have demonstrated clear avoidance of forest roads by elk (Rowland et al. 2000, Wisdom et al. 2004, Wisdom et al. 2005). Some of these studies, (Wisdom et al. 2004, Wisdom et al. 2005) failed to document similar avoidance of forest roads by mule deer, but their analysis was potentially complicated by displacement of deer by elk. Torland (1976) showed that mule deer fawn mortality was reduced by 30% after a road closure program was

implemented in the Tumalo area during the winter of 1972. More recently, the Department documented 1,362 roadkill mule deer on a 100 mile stretch of Highway 97, and 538 on a portion of Highway 31 between 2005 and 2010. During this same time period 17% of known mortalities among the Department's radio-collared deer in Central Oregon were attributed to vehicular collisions (ODFW unpublished data).

Acorn production from Oregon white oak and California black oak and evergreen browse provided by wedgeleaf Ceanothus provide an essential food supply for migratory deer during the energetically limiting winter season. Unfortunately, both oak and Ceanothus habitats have been identified as at-risk by the Oregon Conservation Strategy (ODFW 2006), because they occur at low elevation areas subject to conversion to developed or agricultural use and require fire to prevent encroachment by conifers, or in the case of Ceanothus, to release fire dependent seeds. Loss of these habitats through development or decreased productivity could significantly limit wintering big game numbers.

Step 3: Is the Habitat "Irreplaceable"? **No.**

"Irreplaceable" means that successful in-kind habitat mitigation to replace lost habitat quantity and/or quality is not feasible within an acceptable period of time or location, or involves an unacceptable level of risk or uncertainty, depending on the habitat under consideration and the fish and wildlife species or populations that are affected. "Acceptable", for the purposes of this definition, means in a reasonable time frame to benefit the affected fish and wildlife species.

In some areas, opportunities may exist to successfully mitigate for impacts to deer and elk habitats. Restoration of less suitable or degraded existing winter or summer concentration areas to a more functional vegetative condition or allowing wintering deer and elk access to, and protection from, disturbance within these habitats can increase access to quality and/or quantity of summer and winter concentration areas, and ultimately the specific functions and values those habitats provide for the species. Both have been successfully accomplished in the past and can occur within an "acceptable" period of time considering the life history of deer and elk.

### **Category 3 Habitat: Year-round Major Habitat**

As defined in the ODFW Fish and Wildlife Habitat Mitigation Policy OAR 635-415-0025(3), "**Habitat Category 3**" is essential habitat for a fish or wildlife or important habitat for fish or wildlife that is limited either on a physiographic province or site-specific basis depending on the individual species, population, or unique assemblage.

Step 1: Is the Habitat "Essential"? **Yes.**

"Essential Habitat" means any habitat condition or set of habitat conditions which if diminished in quality or quantity, would result in depletion of a fish or wildlife species.

Year-round major habitats differ from both winter and summer concentration areas in that they contain patches of essential habitats such as high quality forage, cover, and fawning or calving areas in relatively close proximity to each other. Resident, non-migratory behavior has been observed in Oregon's Coast Range (Miller 1970, Hines 1975), portions of the Klamath Mountain ecoregion in Josephine County (Niemela 2011), and in urban areas (Happe 1982). Non-migratory black-tailed deer generally do not have discreet summer and winter ranges, but may make seasonal adjustments by traveling to lower elevations to avoid snow, or gaining elevation to reach open south-facing meadows at the top of ridgelines (Dasmann and Taber 1956, Miller 1970, Loft et al. 1984).

The majority of these types of habitats are located at moderate to higher elevations in the Coast Range, Klamath Mountains, and the western slope of the Cascade Range. Year-round major habitats typically consist of larger blocks of federal, state, and private lands primarily managed for timber production, recreation, and conservation, smaller portions of which are managed as wilderness or later seral stage timber or other natural vegetation types. However, it should be noted that many portions of mapped year-round major habitat may be actively managed for continuous timber production and maintained in blocks of early seral stage conifer monoculture. These habitats may provide important habitat functions and values such as forage, cover, or connectivity habitats, but may lack intermixed significant patches of habitat providing essential functions and values necessary to fulfill all life history requirements. Any larger site specific areas exhibiting primarily essential functions should be considered on a project specific basis, and in context of the specific habitat structure, type, and age at the time of a development proposal.

Step 2: Is the Habitat "Limited"? **No.**

"Limited Habitat" means an amount insufficient or barely sufficient to sustain fish and wildlife populations over time.

Although patch size and distribution of specific habitat components within year-round major habitat vary, the larger contiguous blocks of multi-aged vegetation types are not considered limited from the perspective of being sufficient to sustain deer and elk populations over time.

#### **Category 4 Habitat: Year-round Peripheral Habitat**

As defined in the ODFW Fish and Wildlife Habitat Mitigation Policy OAR 635-415-0025(4), "**Habitat Category 4**" is important habitat for a fish or wildlife species.

Step 1: Is the Habitat "Essential"? **No.**

"Essential Habitat" means any habitat condition or set of habitat conditions which if diminished in quality or quantity, would result in depletion of a fish or wildlife species.

Year-round peripheral habitats differ from year-round major habitats in that they contain patches of important habitats such as forage and cover areas intermixed within habitats that

are primarily managed for intensive earlier seral stage timber production, agriculture, grazing, or other more intensive land use. Although these areas do support predominately non-migratory populations of deer and elk, the presence of deer and elk results in greater conflict with, and damage to, vegetation associated with these more intensively managed land use types.

The majority of these types of habitats are located at lower elevations and in the foothills of the Coast Range, Klamath Mountains, and the western slope of the Cascade Range. Year-round peripheral habitats typically consist of smaller blocks of private lands primarily managed for intensive timber production, with some cultivated agriculture, grazing, rural residential and other land uses intermixed. However, it should be noted that some portions of mapped year-round peripheral habitat may be in conservation ownerships, or provide both important and essential habitat functions and values such as intermixed patches of habitat, which provides essential functions and values (e.g., high quality forage, cover, and fawning or calving areas) adequate to fulfill all life history requirements. Any larger site specific areas exhibiting primarily essential functions should be considered on a project specific basis, and in context of the specific habitat structure, type, and age at the time of a development proposal.

Step 2: Is the Habitat “Important”? **Yes.**

“Important Habitat” means any habitat recognized as a contributor to sustaining fish or wildlife populations on a physiographic province basis over time.

Year-round peripheral habitats contain patches of important habitats such as forage and cover areas intermixed within habitats that are primarily managed for intensive earlier seral stage timber production, agriculture, grazing, or other land use.

Step 3: Is the Habitat “Limited”? **No.**

“Limited Habitat” means an amount insufficient or barely sufficient to sustain fish and wildlife populations over time.

Although patch size and distribution of specific habitat components within year-round peripheral habitat vary, the predominance of intensive earlier seral stage timber production, agriculture, grazing, or other more intensive land uses are not considered limited from the perspective of being sufficient to sustain deer and elk populations over time.

Impacted Area: Impacted areas are locations subject to anthropogenic development where traditional wildlife management tools such as hunting are not available, and wildlife populations could cause significant conflict. In some circumstances, the productivity of human landscaping and protection from predators within urbanized areas can artificially increase big game populations (Bender et al 2004). Unfortunately, these artificially inflated suburban big game populations contribute little in the way of ecological function or economic value to local

economies, and can cause chronic damage problems, human safety concerns, and conflict over feeding between neighbors, and increased incidence of disease (Thompson and Henderson 1998, Farnsworth et al. 2005). The Department has documented a wide variety of disease in suburban deer populations including fungal and bacterial diseases, severe rumenitis, Deer Hair Loss Syndrome, and Adenovirus Hemorrhagic Disease. Although these areas may support substantial numbers of deer (Happe 1982, Bender et al. 2004) or elk, traditional proactive management actions are often not possible and/or ineffective due to local ordinances and proximity to people. The Department will not recommend habitat protection or classification for impacted areas based on deer and elk use. However, areas defined as impacted for deer and elk may still be used by other species and warrant habitat protection and classification.

Cultivated Agriculture: Although some areas of historic deer and elk habitat which have been converted to cultivated agriculture could still support deer and elk from a forage quantity and quality perspective, most landowners are unwilling to allow deer and elk to occupy and “damage” cultivated agriculture. Therefore, specific historic deer and elk habitat parcels which have been converted to cultivated agriculture should be categorized based on habitat functions and values for other fish and wildlife species, and should not be based on deer or elk use.

Department Deer and Elk De-emphasis Areas: The Department has identified a few Wildlife Management Units (WMUs) as Deer or Elk De-emphasis Areas. These areas are typified by a very high percentage of private land with extensive areas of agricultural land uses that may incur severe damage as deer or elk populations increase or concentrate. In these designated areas there are no deer or elk population set Management Objectives, because the primary emphasis is to address property damage rather than maintain specific population size. However, these habitats are utilized by deer and elk where property damage is tolerated by landowners or managers. Currently, the Willamette WMU is identified as both a deer and elk de-emphasis area. The Melrose and Applegate WMUs are identified elk de-emphasis areas. Therefore, specific historic deer and/or elk habitat parcels contained within these de-emphasis areas should be categorized based on habitat functions and values for other fish and wildlife species, and should not be based deer and/or elk use depending on their species specific designation de-emphasis areas.

## **6. Identifying and Mapping Deer and Elk Habitats**

The Department has iteratively identified and mapped<sup>1</sup> deer and elk habitats over the past half a century or more as information has become available, research has been completed, and as observations of deer and elk habitat use have been collected. A western Oregon specific effort to systematically analyze historic and current data and information and map current deer and elk habitats for Columbian black-tailed deer, Columbian white-tailed deer, and Roosevelt elk using GIS shape files was completed in 2015 in order to develop a Department geospatially referenced map of deer and elk habitats for western Oregon (Appendix A).

These mapping efforts included the comprehensive review of both existing internal and external mapped deer and elk winter habitats and incorporated agency research data,

telemetry data, observational deer and elk habitat use (both air and ground observations), and professional judgment as available for each individual game management unit. Existing mapped deer and elk winter habitats also included incorporation of information from County Land Use Goal 5 big game habitat maps, Western Association of Fish and Wildlife Agencies (WAFWA) Mule Deer Habitats of the West maps, and Rocky Mountain Elk Foundation (RMEF) elk habitat maps.

<sup>1</sup>The mapping of deer and elk habitats at the landscape scale requires the inclusion of many site specific habitats which may not function independently of surrounding habitats at a landscape scale. For example, most areas of the western slope of the Cascades are mapped as either Major or Peripheral Year-around Habitats when considered at the landscape scale. However, it is likely that smaller portions of the habitats, when considered at the site specific scale, may not actually support deer and elk every day of the year or continuously through both the summer and winter periods (e.g., higher elevation habitats in the Cascade mountains), but the individual deer or elk they do support exhibit a predominately non-migratory life history.

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